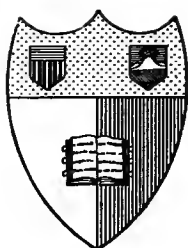


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CANONS
OF CLASSIFICATION

BY

W. C. BERWICK SAYERS



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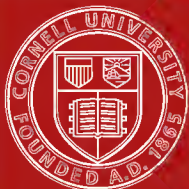
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CANONS OF CLASSIFICATION

CANONS OF CLASSIFICATION

APPLIED TO "THE SUBJECT"
"THE EXPANSIVE", "THE DECIMAL"
AND "THE LIBRARY OF CONGRESS"
CLASSIFICATIONS

A STUDY IN
BIBLIOGRAPHICAL CLASSIFICATION METHOD

BY

W. C. BERWICK SAYERS

FELLOW (BY DIPLOMA) OF THE LIBRARY ASSOCIATION AND
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JOINT AUTHOR OF "THE CARD CATALOGUE."

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TO
THE MEMORY OF
JAMES DUFF BROWN
A CONSUMMATE LIBRARIAN
AND TEACHER
AND THE
GENEROUS HELPER OF ALL LIBRARY STUDENTS

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NOTE

THE papers on *Some Canons of Classification*, and on *The Subject* and *The Decimal* classifications were read before the Library Association, and have since been revised and amplified; that on *The Expansive Classification* is a thesis which was accepted for the Diploma of the Association. These have appeared in *The Library Association Record*, and I am indebted to the Publications Committee of the Association for permission to reprint them. That on *The Library of Congress Classification* has been written at the suggestion of the Publishers. In the Preliminary chapter I have incorporated the substance of an article contributed to *The Library World*, and my final chapter is a revised reprint of another article from that journal. My acknowledgments are due to the Editors.

The chapters were written at intervals and each was intended to be complete in itself. There is in consequence some repetition in the work, but I think the student may find this to be an advantage.

The omission of an index is deliberate. Although

I dislike even small books without indexes, I concluded, after tests with an index I had made, that the work did not lend itself usefully to indexing.

I am indebted to my wife for proof-reading and for suggestions.

W. C. BERWICK SAYERS.

CROYDON.

CANONS OF CLASSIFICATION

CHAPTER I

THE STUDY OF CLASSIFICATION

I. THE origin of these essays was my own necessity. As an initiate in librarianship the schedules of certain large, popular systems of classification were placed in my hands, with the laconic information that according to them libraries were classified. In common with many beginners I was plunged immediately into complete bewilderment. Column on column of hieroglyphic symbols and terms confronted me, a mighty maze without a plan; and even when I had mastered the ten or twenty-four main classes of the systems, my knowledge was limited by my memory. Of the rationale of the order, the method of subdivision, the qualities of the notation, I had not the faintest conception. Light came by familiarity, but only such light as one gains from a mechanical use of the tables. It was when one read such an elementary work as James Duff Brown's comprehensive little *Manual of*

Library Classification and Shelf Arrangement that one wondered by what impulsion philosophers and librarians designed so many and diverse systems ; what reasoning made them prefer this or that scheme. Naturally, as has been the case of many another over-wise critic, I thought it must be the liking for a particular notation, and I fear that Brown did not enlighten me on this point. When, however, Dr. E. C. Richardson's *Classification* fell into my hands, and had been read so often that I almost believe I could reproduce it from memory, I found a key to my perplexities ; and when Mr. L. Stanley Jast, following—as far as his originality would permit him—in the footsteps of the late Franklin T. Barrett, delivered a course of lectures on classification at the London School of Economics in 1905, I found further that this apparently dry-as-dust study could be one of the most fascinating, suggestive and educative within the province of the librarian.

2. Classification, I saw, is something very different from, and much wider than notation ; indeed, as Richardson said, classification is a microcosm of all knowledge, and notation is only a shorthand abbreviation of classification terms. In simpler words a classification system is a map of things which have being—that have existed, will exist or may exist—and which may therefore form the subject of books or any other material which it may be desirable to arrange. What makes for

the value of one system as compared with another are its generalness of character, its order, the logical process of its subdivision, the quality of its terminology, and (at a later stage) its practicability as shown in its notation and indexing. It became quite clear, therefore, that tests existed for trying classifications; in fact, Dr. Richardson and Mr. Jast formulated "criteria" and "fundamental logical rules" respectively.

3. A study of these rules led me to make not very significant, but as I think useful, additions of my own; and having now a series of tests which I named, perhaps grandiosely, Canons, I thought it would be well to focus them upon a received classification, and to note the results. In 1906 appeared the first edition of *The Subject Classification*, and my first essay was the effort I made to study the system with the Canons. As will be seen, I eschewed the comparative method—the discussion of whether the *Subject* was better than the *Decimal System* or worse than the *Expansive*—and confined myself rigidly to an examination of the order, subdivision, notation and other features of the system. But first I marshalled and explained the Canons, and this part of the Essay is that which students have found to be most helpful to them. Throughout the remaining essays I have endeavoured to use the same tests. In the result it will be seen that not one of the systems defies criticism at all points. This fact does not necessarily condemn the systems;

far from it, but its demonstration enables the librarian to form a reasonable idea of their relative merits.

4. My hope for this work is a modest one: that it will enable the student, who approaches for the first time any of the four systems treated, to view it not as a bewildering, inchoate mystery, but as an organic whole, a building with a definite plan and superstructure. Although the theory of classification enters largely into all my considerations and nearly all theory is based upon such precepts as the Canons present, this does not profess to be a treatise on the theory of classification. Such a treatise would be on a scale far greater than this volume, and Mr. Jast has been engaged in the writing of such an one for some years past. If, however, the student assimilates the material of these Essays he will attain no insignificant amount of theory. For all that, my work will be of most use to the student who has some conceptions of classification order, and I hope I may be pardoned if I indicate what is involved in this really interesting study.

5. Experience as a teacher of classification convinces me that the average student encounters many difficulties in the study which might have been of small account if a few hours had been given previously to certain preliminary studies. Classification is a department of logic, and every step in the construction of a classification scheme is referable to that science. It follows, therefore, that

a number of terms and notions drawn from logic and having the special significance attributed to them by the logician appear in the study of classification; and these cause unnecessary mystery in the first approach if it is not made through a preliminary reading of logic. Not, indeed, that the student should be a logician having the whole of dialectics at his finger-ends, but he should at least have an acquaintance with simple logical terms and notions. I suggest that some such book as Jevon's *Primer of Logic* should be the minimum preliminary reading; or, better still, the same author's *Elementary Lessons in Logic*. Both of these books have interesting subject matter and are models of simple statement. When these have been read, a further work of Jevons, his masterly chapter on classification in his *The Principles of Science*, will be better appreciated. At this stage the student should be the possessor of clear views of nearly every important theoretical problem with which pure classification, as distinguished from bibliographical, has to deal. Then Dr. E. C. Richardson's *Classification, Theoretical and Practical*, may fitly follow, in which the theory drawn from Jevons will be found to be directed to book classification by a really original thinker in what will now prove to be a perfectly lucid manner.

The admirable exhaustive historical and critical bibliography in Richardson will draw attention to the history of the various systems that have been

proposed for the classification of knowledge and books, and this comparative historical study should now be undertaken by a reading of the first six chapters of James Duff Brown's *Library Classification and Cataloguing*; and, as a part of his theoretical studies, the student should master thoroughly the reasoning of Chapter VI, "Classification and Cataloguing," which is one of the best contributions ever made to the literature of our subject. An extended guide to the various philosophical classifications mentioned in Brown, is Prof. Robert Flint's *A History of Classifications of the Sciences*. To gain, by way of revision, a brief perspective of the field of bibliographical classification theory I may be forgiven for recommending my own *Grammar of Classification*, which gives in very concentrated form the principles of classification theory.

6. Not until this study is well advanced should the introductions to the various bibliographical classification systems be studied. Each of *The Subject* and *The Decimal* systems is prefaced by a valuable introduction in which much illuminating matter on the practice of classifying is to be found; but, naturally and justly, these introductions lean towards the virtues of the systems they introduce. They should, therefore, be studied only when the student is prepared to equate them properly.

7. I have been asked on more than one occasion if it were possible to draw up a set of questions dealing with the general principles of classification

in a manner so comprehensive that the student who could answer them satisfactorily would be sure of a place in the pass-list of the Library Association. Frankly, I think it wellnigh impossible to accomplish this within the limits proposed—twelve questions; but an effort may be made to approximate to the desired set.

QUESTIONS

(1) State briefly, with any explanations you are able to offer, the fundamental logical rules of Classification.

(2) "Terms must have an invariable meaning in Classification." "The use of two characteristics in Classification would lead to cross-division." Explain these statements with examples.

(3) Define the peculiar differences in Philosophical and Bibliographical Classification, giving an example of each; and define the difference between natural and artificial characteristics as the basis of arrangement.

(4) Explain the hierarchy of a Classification Schedule, defining the steps by which it divides, and the necessity for mutual exclusiveness in class, division, subdivision, and section.

(5) Define Critical Classification, and give an example of it, imaginary or otherwise.

(6) In order to make a Bibliographical System practical it must be equipped with certain

auxiliaries. Examine this statement, using the auxiliaries of the Decimal, Expansive, and Subject Systems to explain your meaning.

(7) What are the qualities required in a sound notation? Give examples of "mixed" and "pure" notations respectively, and of one in which arbitrary signs are used. Explain also the auxiliaries of notation, and especially the application of those devised by Biscoe, Cutter, Jast, Merril, and Stewart's adaptation of the last named.

(8) The Subject System has a specific index; the Decimal and Expansive Systems have relative indexes. Explain and examine the functions of each form, exhibiting in your answer what you conceive to be the correct method of approaching a Classification Scheme in classifying a book.

(9) Compare the merits of rigid and relative location.

(10) "Classify by subject and then by form." Define the terms in this statement, and the difference between "outer" and "inner" form, and then explain the statement by examples.

(11) Criticise the axiom that it does not matter where a subject appears in a Classification so long as it is indexed.

(12) "Classification cannot supersede cataloguing, nor should the functions of the two things be confused." Examine this statement.

I do not think the above examination is an easy one, but I am convinced that most of the problems of theoretical classification are contained in it ; and the student who in four hours can compass the questions satisfactorily, without reference to his text-books, has a fair chance of satisfying even a rigorous examiner. It is my hope that the pages which follow will be a substantial contribution towards their solution.

8. The actual business of classifying cannot be taught with any finality except in practice. In another little work, however, *A Short Course in Practical Classification*, I have endeavoured to supply some assistance in this direction so far as *The Subject* and *The Decimal* systems are concerned. How far the classifier should memorise the system he is using is another moot point. Very few, even of the most expert, can carry anything like the whole detail of a system in memory. Nor is it necessary ; once the construction of a system is clearly understood the necessary facility in using it will soon be acquired. Undoubtedly, though, the main classes, and the first divisions should be memorised as the best key to practical use, and, after that, practice will bring an astonishingly comprehensive knowledge of the subdivisions ; insomuch that I have known librarians who can remember the whole of *The Decimal* system to at least five places. I can recommend no better aid to the study of the practice of classifying than Mr. L. Stanley Jast's article on

Library Classification in *Greenwood's British Library Year Book*, 1900-1.

9. Daily practice in the application of all systems should accompany theoretical study, nor should the application be confined to books. The articles in such reviews as *The Quarterly*, *The Nineteenth Century and After*, and in the special journals, form excellent problems for the classifier; and perhaps the most difficult test I can offer is the classifying of all the articles, notes, and reports on, say, the four centre sheets of *The Times*.

A SELECT BIBLIOGRAPHY UPON CLASSIFICATION THEORY

10. The following list serves the severely practical purpose of paragraphs 7 and 8 of indicating a sequence of reading matter in theory. I have added somewhat to the list given in the text, but that list should be followed in the first instance. It is the result of work with some hundreds of students:—

LOGIC

JEVONS, W. STANLEY. *Primer of Logic*. 136 pp.

Illus. Macmillan. 1s.

Very simple introduction.

— *Elementary Lessons in Logic*. 12 × 34 pp. 1907.

Macmillan. 3s. 6d.

The best text-book for students who have fair education, but no special knowledge. Should be read through.

JEVONS, W. STANLEY. *Principles of Science: a Treatise on Logic and Scientific Method.* 44 × 786 pp. Macmillan. 12s. 6d.

A scholarly study in dialectics, somewhat too full and special as a whole for the ordinary student of classification. The chapter on classification is essential, and chapters 1-2 on logical notions and terms are very valuable.

THEORY OF CLASSIFICATION

RICHARDSON, E. C. *Classification: Theoretical and Practical:* with Appendix containing an Essay towards a Bibliographical History of System of Classification. Ed. 2, 1912. 16 × 154 pp. 8vo. New York, Charles Scribner's Sons. London, Grafton. 6s. 3d. n.

The only text-book on the purely theoretical side of classification. A scholarly, clear and thoroughly interesting exposition of first principles, and then of their application to library classification. The appendix (which occupies 105 pp.) is the most complete historical bibliography extant.

SAYERS, W. C. BERWICK. *The Grammar of Classification.* 12 pp. Cr. 8vo. Library Assistants' Association Series, 1. 1912. 6d.

A brief conspectus of the theory of pure classification, its application to bibliographical classification, and the application of the latter to books.

HISTORY OF CLASSIFICATION

FLINT, ROBERT. *A History of Classifications of the Sciences.* Bound with *Philosophy as Scientia Scientiarum.* 10 × 340 pp. 1904. Blackwood. 10s. 6d. n.

A descriptive history of "knowledge" classifications from Plato to the present time. The most extensive work of this character in English.

BROWN, J. D. *Library Classification and Cataloguing*. 12 × 262 pp. Illus. 8vo. 1912. Grafton. 7s. 6d. n.

A general, comprehensive text-book on the history of knowledge and bibliographical classifications with outlines, criticisms, etc., and a valuable chapter on the distinction, not always understood, between cataloguing and classification.

RICHARDSON, E. C. *Classification* (noted above).

EDWARDS, EDWARD. *Memoirs of Libraries*. Vol. 2, pp. 759-831. 8vo. 1859. Trübner (out of print).

A full account of the various classificatory systems proposed from the Aldine, 1498, to Edwards' own scheme of date of publication, 1859. Valuable for older schemes such as Gesner, Bacon, Brunet, Bouillard, Horne, etc.

PRACTICAL APPLICATION

BROWN, J. D. *Library Classification and Cataloguing* (noted above).

— *Subject Classification: with Tables, Indexes, etc., for the Sub-Division of Subjects*. 1906. Ed. 2, 1914. Grafton. 15s. n.

The system is prefaced by a valuable introduction dealing with the principles and application of classification.

JAST, L. STANLEY. "Introductory Note [on Classification]." In BROWN, J. D. *Guide to Librarianship*, pp. 24-31. 1909. Grafton. 2s. 6d. n.

Hints on definitions, logical notions, etc.; a

useful chronological list of the principal systems (1) to 1850, and (2) since 1850 ; notes on notations ; and a select bibliography.

CUTTER, C. A. *Expansive Classification*. Pt. I. The First Six Classifications. 160 pp. Imp. 8vo. 1891-93. Boston. C. A. Cutter.

The seventh expansion is not yet complete. The first six, here catalogued, are preceded by various introductions on the principles and practice of the scheme.

DEWEY, MELVIL. *Decimal Classification and Relative Index for Libraries, Clippings, Notes, etc.* Ed. 8. 796 pp. Imp. 8vo. 1913. Grafton. 30s. n.

Extensive descriptive and explanatory introduction, embracing many points in classification practice. Written in phonetic English.

JAST, L. STANLEY. "Library Classification." In GREENWOOD, THOMAS, *British Library Year Book*, 1900-1. Pp. 21-36. Cr. 8vo. 1900.

A brief study of the choice of a system, and the methods of applying it.

SAYERS, W. C. BERWICK. *A Short Course in Practical Classification with Special Reference to the Decimal and Subject Schemes*. 48 pp. 8vo. 1913. Library Association. 1s. n.

A course in the actual classifying of books, consisting of a first lesson giving the rules for classifying and nine other lessons dealing with the classes of the two schemes in sequence ; with numerous readings and exercises.

CHAPTER II

SOME CANONS OF CLASSIFICATION

11. HITHERTO in the literature of classification the method of criticism has been of the comparative order. One system of classification has been placed beside another and their relative merits have been the subject in discussion. Valuable as such criticism may be, it is external and inconclusive ; it is without regular method, rules, or criteria, and it results usually in a discussion of notations. At the outset, therefore, we ask ourselves if there are any means whereby we can discuss the anatomy and physiology of classification, any means by which obvious and superficial criticism of the comparative order may be avoided. We think that an affirmative answer is possible, and proceed to collect and explain from various pronouncements upon classification theory, a series of canons which may serve the purpose in view.

12. A bibliographical classification should be general and comprehensive ; it should be constructed to cover all past and present knowledge. It should have a place for the fantastic theories of the alchemist, and for the vortex theory of the universe,

as well as for the latest scientific discovery made by the yellow press which is to be contradicted tomorrow. Clearly, however, it is impossible to construct a schedule of knowledge which includes the names of things as yet undiscovered. We mean only to imply that its framework should be so constructed that any subject, new or old, not already included can be inserted without disturbing the general sequence. In the sixth edition of The Decimal Classification the topic "Radium"¹ does not occur; in the seventh and most recent edition it does: as we see from the following:

SIXTH EDITION.		SEVENTH EDITION.	
546·4	Alkaline Earths.	546·4	Alkaline Earths.
546·41	Calcium.	546·41	Calcium.
546·42	Strontium.	546·42	Strontium.
546·43	Barium.	546·43	Barium.
546·44	Magnesium Group.	546·432	Radium.
		546·44	Magnesium Group.

The interpolation has been achieved without any dislocation of the general order, and Radium receives its correct place amongst its cognate subjects. The principle here made apparent is the cardinal one in classification. In the first instance the system must cover the whole range of knowledge in a determined order; in the second place it must be infinitely expansible. If this can be observed the system can never become obsolete in the sense

¹ See also section 110.

of becoming impracticable however much knowledge may change in its details. Every change as it occurs can be recorded in its appropriate place.

13. Its order should be the order of ideas in history ; which may be expressed variantly as the historical order, or the order of evolution.

The principle here enunciated applies primarily to general bibliographical classification ; and while it may be regarded as a law in one sense, it is the expression of the " ideal " view of classification. To explain : Classification assembles things by their resemblances and separates them by their differences. These resemblances and differences may be inherent properties of the things (*natural characteristics*) as, for example, the shape—oval or round—of the hair in man ; or they may be accidental properties (*artificial characteristics*) as the colour—red, flaxen or black—of man's hair. If the first characteristics are the basis of the classification, it is a natural, if the second, it is an artificial classification. Generally speaking the natural arrangement enables us to infer a great many of the properties of the things arranged ; and to attain to evolutionary order natural characteristics must prevail. It is impossible to trace the evolution of man by the colour of his hair, his name, or his size. It is possible to do so by studying his anatomical and physiological features.

A commonly accepted, and seemingly opposed, view is that the order shall be that most convenient

to the user of the system ; or, in more formal language, the characteristics chosen as the basis of the arrangement shall be essential in relation to the purpose of the classification. This is a wider view, but is not necessarily antagonistic to our rule of evolutionary order. An evolutionary order may be, and as a rule is, most useful to the user of a general classification ; but, for special purposes, men may require special arrangements. For example, a binder may prefer to arrange books by bindings, an antiquarian bibliographer by their printing types, a print collector by the kind of illustrations in them, and so on. All these are artificial arrangements, but within each of them history may still prevail.

It is when we come to view knowledge as a whole, as we must do in a general bibliographical classification, that we postulate the order of ideas, or history, or evolution as the criterion.

14. Its process of division should be from the general head to the special head, should—to use the language of logic—proceed from terms of wide extension and small intension to terms of narrow extension and great intension. And this progress from the general to the special should be a gradual one ; each term or heading should rise naturally from the term preceding it and modulate into the term following, and so a co-ordination of the headings will be obtained, according to the standard definition of classification which provides that

things and ideas must be arranged together according to their degrees of likeness and separated according to their degrees of unlikeness. It is curious that this rule is constantly broken by the *Decimal Classification*, and these transgressions are the theoretical imperfection of that system. The ten main headings do not modulate into one another in several places ; to quote the often-mentioned examples, Language is separated from Literature by three alien divisions, Sociology, from its correlative, History, by five. But almost as bad is the subdivision of these headings ; in 100 Philosophy, for example, all kinds of subjects having, of course, some relation to one another are jumbled up without the least regard to exact affinity. The division reads : Metaphysics, Mind and Body, Philosophical Systems, Mental Faculties and Psychology, Logic, Ethics, and Ancient and Modern Philosophers. In this remarkable arrangement the utterly alien heading, Philosophical Systems, is sandwiched between Mind and Body and its cognate heading Mental Faculties, while Philosophical Systems, which is surely a heading related to Ancient and Modern Philosophers, is separated from it by Mental Faculties, Logic and Ethics. We suppose that Dewey's 100 is the dreadful example among systems which claim to be exact or scientific of the want of co-ordination.

15. It is clear also that the usefulness of a classification depends upon its minuteness ; therefore, the enumeration of parts under any heading must

be exhaustive, be arranged that it may always represent to the fullest the state of knowledge covered by the heading. In a knowledge, as opposed to a book classification, an organism can be divided until a definite place is found for the minutest of its component parts. A book classification must always be governed by the artificial form of large classes of composite and other books which have not specific subject matter. Consequently to a certain extent book classification can never be perfect, and this is the justification of Jevons's statement that the classification of books by subjects is a "logical absurdity."¹ At the same time Jevons did not know of the generalia and form classes, and form divisions, by which composite and other intractable books are provided for; nor did he realise clearly the difference between a subject proper and a particular view of a subject. A book classification must hold the minuteness of the knowledge classification as an ideal to which it must approximate as nearly as possible.

16. We may further postulate that any name used to denote a heading in classification should have a specific and well-defined sense, and should bear no other interpretation wherever it occurs in the scheme. When we speak of a man as bearing tribulation with "philosophy," we do not mean that his attitude is

¹ The statement is made in Jevons's *Principles of Science*, Chap. XXX, p. 715, of 1892 edition. For an answer see Brown's *Library Classification and Cataloguing*, Chap. VI.

the outcome of all the characteristics enumerated under Dewey's heading—that is to say, we do not think him to be metaphysical, logical, ethical, or socratic; the word used conversationally is not the comprehensive term Dewey uses; it has a much narrower meaning. But in classification the term must be defined clearly and the sense arrived at used consistently throughout the system. This rule of the exact definition and limitation of terms is particularly important, as there are scores of words in the language which have concrete and abstract, or metaphorical and practical, or comprehensive and narrower meanings.

17. In the application of terms, the introduction of any name which exhibits a critical view of the subject it connotes is a violation of one of the first principles of classification. The flagrant example again comes from Dewey's section Philosophy, where, as critics have remarked frequently, under the heading Delusions, we have Astrology, Second Sight, Palmistry, and Spiritism, which, strange to say, are names of studies which some folk, who have a right to their point of view, actually regard as sciences worthy of a lifetime's devotion. (Again, we have known classifiers to place the Rev. J. R. Campbell's *The New Theology* under Atheism.) Headings should be rigidly descriptive; the classifier's point of view in regard to any subject may indeed be valuable, but it is non-essential for arranging his subjects.

18. The characteristics used must themselves be quite consistent. We might make some kind of a classification of the *genus homo* by arranging men by the shape of the skull, the direction or colour of the hair, or the contour of noses, but we must keep the chosen characteristic throughout. Our sequence of aquiline, Roman and snub noses must not be followed by red noses, for example, or we shall have the confusion of cross-division, as the quality of redness may be common to the various groups preceding.

19. As a corollary to this, no two headings should overlap. This is an ideal not always realised, and books, as we know, have perpendicular and lateral relations from all points of view which make it very difficult to confine them to any heading. However, the ideal demands that headings should be mutually exclusive, and we can only criticise from the ideal with any good result.

20. Our classification must be equipped with generalia and form classes in order to adjust it to the physical form of books. Here we make a clear distinction between a knowledge and a bibliographical system. That of knowledge is only limited by knowledge itself. Our *ideas* of things can be so completely analysed that we can arrange them in perfect sequences ; the schedules can modulate with perfect and gradual steps. But the classification of books is conditioned by the physical form of books. Treatises may be written on every specific

subject in the universe, and these we may arrange by a knowledge classification simply ; but it must be remembered also that books are complex things ; the general treatise hustles the monograph ; there is the encyclopædic work, and the work of composite nature which treats of two, three or more subjects. It is clear that there can be no absolute perfect co-ordination in the arrangement of the subject matter of these various works. The designer of a bibliographical system must adjust the knowledge classification so that it will embrace as many books as possible in their entirety, and must then compromise. It must be clearly borne in mind, however, that the classification of knowledge should be the basis of the classification of books ; that the latter obeys in general the same laws, follows the same sequence. A small consideration will show us how books overlap. Consider, for example, a general work dealing with forty distinct topics—one scientific, another artistic, another historical and so on. In classifying such a book it is perfectly clear that if we put it under science we lose or ignore all the other subjects of which it treats, and the book because of its composite character does not correlate with the books around it. But a book is a concrete indivisible thing ; and we cannot split this book into forty parts and assign each part to its proper subject. We can only put the book as a whole into one place. Therefore, unless we adopt some artificial expedient some part of the signifi-

cance of the book will be lost by our classification. One solution of the difficulty would be to obtain forty copies of the book and place one under each topic represented in the book, but we need hardly emphasise the fact that recourse will not frequently be made to such a method. Consequently as he can place the book only under one heading the classifier has designed a generalia class in his scheme. In the Dewey and Cutter schemes such a class exists called General Works, in Brown it is called Generalia. This class receives all such works as cannot be received by any one single class but which overlap several classes. Where a book deals with only two or three subjects this generalia class is not used, but the book is placed under the predominating topic and a *reference* is made from the second topic in the catalogue. The generalia class is simply for books of such miscellaneous subject matter that they cannot be referred logically to any class. It was partly on this ground of the composite character of books that Jevons called book classification a "logical absurdity." It was because of his habitual use of dialectical refinements that he overlooked the many practical adjustments the librarian makes in adapting the classification of knowledge to the requirements of a classification of books.

21. Every bibliographical scheme has topic or subject classes and form classes. What the subject class means is quite clear to us ; in it the book is arranged by its subject or its predominating subject ;

in the form class, on the other hand, the book is arranged not by the subject but by the form in which the subject is presented. Thus the division Literature subdivides generally by the accident of language, which, it may be noted, has no definite bearing upon the subjects of the books. The subdivisions are poetry, drama, fiction, essays, oratory, letters, satire and humour, and miscellany. The mention of poetry gives rise immediately to the notion of thought or words cast into a metrical form, but of the subjectival side tells us nothing ; poetry may be religious, as Milton's ; didactic, as Pope's ; it may be classical, as some of Tennyson's and much of Keats' ; it may deal with love, wine, or war ; but we learn nothing of this from the word poetry. But all of these poems, irrespective of subject, are arranged together simply by their form. The same reasoning would apply to drama, fiction, essays, oratory, or letters ; these may deal with any subject, but in the arrangement that is ignored. To crystallise this into a definition : A form class is one in which the book is classified not by its subject matter, but by the form in which the subject matter is presented.

22. There is a somewhat more difficult application of the principle of " form " in classification to which we invite particular attention. If we glance at the full tables of the *Decimal Classification*, say under 500, Science (but any other division will serve as an example), we shall see that the beginning of the

schedule of the subject embraced by the division is devoted to *general works on the subject*. As applied to the subject this is the generalia division of the subject, and may be defined in the same terms as the main generalia class, except that instead of applying to the whole classification as does the main class General Works, it applies only to the class Science. Notice also that the subdivisions 501-509 are a *specialised* repetition, to some extent, of 001-009, the subdivisions of General Works. To quote at random : 501 deals with the philosophy, the theory, or utility of Science in General ; 506 with periodicals of Science in General ; 509 with the history of Science in General. Now these are the " form divisions " of the subject Science in General. " Special forms " differ from general " forms " in this way. The periodical, *The Spectator*, deals with all kinds of topics, general history, politics, literature, art, science ; in fact, everything comes within its scope. Its place in a scheme of classification is therefore under General Periodicals ; in the Decimal system it goes under 050. On the other hand, the periodical *Nature* as compared with *The Spectator* is a special periodical, because it is devoted to Science. It will therefore go first under Science—which is its " subject "—and then, within the class Science, under periodicals—which accords with its " form." Note again that while *Nature* is special as compared with *The Spectator*, it is general in regard to the class Science. It is general, therefore, in

comparison with *The British Astronomical Association Journal*, which deals entirely with Astronomy, or *The Journal of the Chemical Society*, which is special to Chemistry. Similarly, as we pass down the general form divisions of Science, 501-509, we must remember that the same rule applies. Premising a work on *The Evolution of Scientific Ideas since Thales*, we must place it first under its subject, which is evidently General Science, and then under its form, which is Evolution, or History; hence in the Decimal system under 509. When we come to more minute heads the same rules still prevail. The main division Physics is equipped with a series of form classes, philosophy, dictionaries, etc.; see 530.1-530.9. Hence a book on the theory of physics will be arranged first by its subject, Physics; then by the form in which it is presented, Theory, i.e. Philosophy; hence in the Decimal system under 530.1. In reaching this distinction between form and subject, we have become cognisant of a rule of practical classification: Classify first by topic, then by form, except in the form classes, where form is paramount. Although we have taken our examples from Dewey, it must be remembered that any other scheme should be equipped with Form Classes. In the Subject system the form *divisions* under the topic classes are obtained by means of *Categorical Numbers*, which have the same functions as the numbers 501-509 in Dewey. This we shall deal with further

when we come to consider the Subject system itself.

23. Next there is the question of notation. A classification without a notation, or a series of symbols to denote every heading and its divisions, is for library or bibliographical purposes useless. The choice between several modern classification systems, as has often been pointed out, is often merely a choice of notation. A notation to be perfect should be a pure notation ; that is to say, it should consist entirely of one kind of symbol, be it letter, figure, or arbitrary sign. However, no existing scheme answers this requirement in its entirety. Further, that arrangement of the symbols is best which shows immediately the sequence ; from which it is easily deduced that a numerical notation is far simpler than an alphabetical. The mind immediately recognises that 8 follows 7 and precedes 9, but we use an alphabet regularly without realising which letter follows which, and it often requires some calculation before we remember that x precedes y and follows w ; our point is that immediate apprehension cannot be had of a sequence of letters, but may be had of a sequence of figures. The usefulness of the notation will be governed by its capability of expanding, its elasticity. Therefore the notation must be so constructed that by the addition of a symbol or symbols at any point new subjects or headings may be inserted into the classification. And, although the length of any given

classification number is not an essential point provided the number is simple, the briefer the notation is the more likely is it to obtain favour.

24. Finally, the classification must be provided with a relative index. The index must include all the names (terms) mentioned in the schedules and all the synonyms of these names. It should show all the minute parts of a subject, as far as practicable ; parts which are included in the terms in the schedules but are too minute to be set out. The principal value of the index is to ensure that a subject always has a constant place in the scheme. For example, when Radium was discovered, the treatises expounding it demanded a *decision* in classification. Some libraries placed them under Electricity (Dewey 527), while others placed them under the Metals in Chemistry (Dewey 543). Although the latter head is probably to be preferred in that it brings Radium beside Uranium and its other cognates, the important point is not which head should be chosen, but that the one selected should be remembered and constantly used, so that all books on Radium should be found together. Hence when the decision was made, the classifier entered it in the index of his scheme as a check upon the future placing of books on the subject.

25. Indexes are of two kinds, *specific* and *relative*. The specific index shows only one place for each subject, and the index to the Subject system is of this variety. It does not show the relations of

subjects. A relative index shows every aspect and relation of a topic. For example, in the Subject system the topic Sugar receives references I885, which deals with it as an Industrial product, and E348, which deals with the sugar cane as a member of the botanical group. The index ignores the use of sugar in confectionery, and, in fact, any other aspect of it. The reference is really one reference to Sugar I885. This is called special or specific indexing. On the other hand, the Decimal system shows the following under the heading :

Sugar, adulterations	614.311
„ cane, agriculture	633
„ manufacture	664.1
„ organic chemistry	547.3
„ refinery	664.1
„ refining, air pollution	614.734
„ vegetable drugs	615.352

Hence we are shown all (or many of) the functions of Sugar, all (or many of) the correlatives of the topic. Now, there must be places in the Subject system for all these relative topics, but they are not shown in the index. The Decimal system, then, has a relative, the Subject a specific index. The student should note carefully that an index is an aid to, not a means of, classification. Books should always be placed by study of the main schedules, with a distinct understanding of the heading under which they are placed. Placing by the index would lead to all kinds of ridiculous anomalies.

A SUMMARY OF THE FOREGOING CANONS

General.

1. A classification should be comprehensive, embracing all past and present knowledge, and allowing places for any possible additions to knowledge.

2. It should follow in its form the order of ideas, history or evolution.

3. At the same time characteristics used must be *essential* in relation to the purpose for which the classification is intended.

4. Characteristics must be consistent, the same characteristics being sought as the arranging factor in every object.

5. Characteristics should be mutually exclusive, no two headings should overlap.

6. It should commence with terms of wide extension and of small intension and proceed to terms of small extension and great intension.

7. In this process the steps should be gradual, each term modulating from the term before it and into the term following, thus exhibiting perfect co-ordination of subjects.

8. The enumeration of parts should be exhaustive.

Terms.

9. Names used in classification must be used in one sense throughout, and indicate characteristics of the same kind or order.

10. Terms must not be critical or express an evaluative opinion of the subjects they denote.

Generalia and Form Classes and Divisions.

11. It must be equipped with artificial Generalia and Form classes and divisions to accommodate composite works, works in which the form predominates over the subject, and works in which specific subjects are treated from particular points of view.

Notation.

12. It should be furnished with a notation which provides a shorthand sign for every topic classified.

13. The notation should be pure ; that is to say, it should be composed entirely of one kind of symbol.

14. It should be elastic, and so constructed as to permit the re-division of any number or the intercalation of any new one without disarranging the sequence.

CHAPTER III

THE SUBJECT CLASSIFICATION

I. *A Review of the System*

26. THE compiler of the new system takes the field of knowledge and arranges it into four broad arbitrary divisions: Matter and Force, Life, Mind, Record. The order aimed at is clearly evolutionary. Matter and Force are the primary factors of the cosmos, and from them is produced Life. Life in turn reaches its highest product in reason or Mind, and Mind again reaches its summit when it chronicles its processes and makes Record. This is the basis of the scheme, this tracing of every operation of nature and art from its primary force or science to its highest manifestation or record. It is scarcely possible to conceive of any department of human knowledge which is not covered by these divisions. Hence, on the face of it, this outline is sufficiently comprehensive. Not for bibliographical purposes, however; Mr. Brown recognises the intractability of books, and adds perforce the ironical heading, *Generalia*, which in a classification scheme is equivalent to the item "Sundries" in a cash ledger.

From this basis the system proceeds to form its main divisions on a simple, but carefully reasoned plan :—

GENERALIA forms a group by itself.

MATTER AND FORCE resolves itself into
Physical Sciences.

LIFE into

Biological Science.

Ethnology and Medicine.

Economic Biology.

MIND into

Philosophy and Religion.

Social and Political Science.

RECORD into

Language and Literature.

Literary Forms.

History, Geography.

Biography.

Thus far the main classes have developed logically from the basis laid down, except under Life, where Ethnology is intercalated between Biological Science and its application, Economic Biology—and it is to be remembered that the aim of the scheme is from fundamental science to artificial application.

27. It will be impossible in our limited space to examine even perfunctorily the whole process of division under these main divisions. A few typical headings must serve to exhibit the more striking features of the scheme.

28. Every bibliographical classification scheme is equipped with a heading equivalent to General

Works, Generalia, or Miscellanea, and this has been a receptacle for works of so composite a character that no other heading in the class would contain them—general encyclopædic works, periodicals and similar works. Here we are startled somewhat when we read that Mr. Brown's Generalia embraces:—

- A0 Generalia.
- A1 Education.
- A3 Logic.
- A4 Mathematics.
- A5 Geometry.
- A6 Graphic and Plastic Arts.
- A9 General Science.

Hitherto we have regarded Education, Logic, Mathematics and the Graphic and the Plastic Arts—Painting, Drawing, Photography and Sculpture, as specific subjects, perhaps not always considering carefully whether they did or did not modulate into their positions in the groups to which they were assigned. Mr. Brown's contention is that they are not particular to any science, but pervade all sciences. But Education, Logic and Mathematics surely imply Mind, and the Graphic Arts are clearly related to Record. Hence the logical scheme seems to have been outraged at the start ; for in an exact scheme it is clear that no specific topic can appear in Generalia. It seems to us that the theory that these subjects are general and pervasive is open to grave question. Education is a term indicating a process by which a man becomes capable of being

a member of society. Special education, in any art or science, is another subject altogether, and its place is with the art or science. While we consider Education a factor of Social Science there is also its indubitable relation to Psychology ; either of these places will take it with more or less reasonableness. And Logic is inseparable from the subject Psychology ; logical method is of course applicable to all knowledge, but Logic itself is the statement of the fundamental laws which govern the mind in working on the phenomena of thought, to wit Psychology. Mathematics and Geometry again are simply arbitrary statements of physical laws. They have no vital relation to any branch of knowledge outside the domain of physical science, although appeal is sometimes made to Mathematics from other sciences, as in the graphic method of statistics in political economy. Therefore, a place for Mathematics and Geometry should have been found in Physical Science. Strangest of all is the contention that Graphic and Plastic Arts are pervasive. It can be assumed that illustrations and models are used in all arts and sciences, but the assumption will not bear the question : are they vital, inherent parts of them ? It is perfectly evident that Painting and Sculpture are means of recording things, correlatives of Writing, and should have been placed, as one able critic of the scheme has remarked, in juxtaposition to Literary Record and labelled Pictorial Record

29. Under the heading Physical Science the author commences to work out in detail the theory laid down as the basis of the order. " Its basis is a recognition of the fact that every science and art springs from some definite source. The old distinction between theoretical and applied science is fast disappearing from all modern text-books, and it is obvious that as the systematisation of science and its teaching improve, the separation between physical basis and practical application, hitherto maintained, will no longer be insisted upon. In this scheme of Subject Classification every class is arranged in a systematic order of scientific progression, as far as it seemed possible to maintain it ; while applications directly derived from a science or other theoretical base have been placed with that science or base. Composite applications of theory have been placed with the nearest related group that would take them without strain, and, as a general rule, all through the classification the endeavour has been to maintain a scheme of one subject, one place." So far the author ; and the result in section B-D, Physical Science, is certainly in collision with our conventional conceptions. Commencing with the pure science of Physics and Dynamics, we proceed to their applications, Mechanical Engineering, Machinery, Civil Engineering, Architecture—a heading which includes Building—Railways, Vehicles, and so on. We then return to a pure science in Electricity and proceed to Elec-

trical Engineering. Then from Optics we proceed to Telescopes and Microscopy ; from Heat to Steam and Gas Engines ; from Acoustics to Music ; from Physiography to Clocks ; from Chemistry to Glass Manufacture. Thus in one continuous historical or evolutionary sequence the headings proceed from the underlying science to its final application. Assuming the progression to be perfect in its detail, this arrangement approaches more nearly to the theoretical ideal than any other known to us. Its practical perfection is more questionable. This continuous development of knowledge is contrary to the modern tendency towards specialisation. The physicist as a rule is concerned with electricity, magnetism, optics, light and heat in the abstract, and will be misled by finding electric wiring, steam engines and other subjects related to, but outside of, his sphere intercalated between his special subjects. Several curious separations occur as the result of this method. Railway Engineering is away from Civil Engineering ; Steam Engines go under their motive force, Heat ; Pneumatic Engines under Physiography ; Electrical Engines under Electricity, and so on ; these have clear relations and should not be so separated. Then Music may be a product of Sound, and its position after Acoustics is defensible on that ground, but Music is sound worked upon by high creative intelligence, by the artistic mind. Consequently it has definite relations to *Æsthetics* ; to place this divine art after Acoustics

and to call it a Physical Science is to ignore its functions and history entirely, and is equivalent to arranging a Gothic cathedral with granite simply because it is built of this material.

30. Later in the scheme Mr. Brown himself realises the impossibility of adhering to his proposed order. Otherwise why does the section Economic Biology exist at all? It includes merely practical applications of the subjects covered by E-F, Biological Science; for example, Agriculture is but a practical development of Botany; Veterinary Medicine is a topic related to Animals; Woodworking is a practical development of Trees. The truth is that subjects such as are usually called Useful Arts do not invariably develop from a distinct scientific base, and then the breaking of the supposed logical sequence becomes the right process. Would that Mr. Brown had broken it a little oftener.

31. As an example of arrangement it would be difficult to excel the section G-H, Ethnological and Medical Science. Here, in an unbroken sequence, Man is arranged from his first emergence from primitive darkness through his evolution, his structure, functions, disorders and recreations. The only comment we have to make is that the great group Medical Science completely ignores Comparative Medicine, which is placed as Veterinary Medicine right away in Economic Biology. A modern medical classification would, we imagine, regard Veterinary Medicine as one of its subdivisions, as

the approach to human pathology, and medicine is largely through the study of and experiment upon other animals.

32. The other sections of the scheme are generally excellent in their order. Especially worthy of note are the arrangements of History and Geography, where the line of demarcation between universal and special aspects of the subjects is well defined. Such needed places are provided as the Holy Roman Empire, the United Kingdom and the British Empire. Biography, too, is most excellently and elaborately provided. Some separation occurs at M, Language and Literature, where the Forms of Literature—Fiction, Poetry, Drama and Essays—are separated from the books dealing with them, and are arranged irrespective of language in one sequence of authors. This may serve for a small or very general library, but is impossible for a large or special one, where the student wants the critical work side by side with the text criticised.

33. The new classification is minute. The main schedules provide approximately 10,000 places. Most schemes as a rule have under each main class a series of general heads, or form divisions for histories, outlines, theories, and forms of the class. Here these divisions have been enormously extended in separate tables called Categorical Tables. These tables are an inherent part of the scheme, as no place for form divisions as such appears in the main schedules. They provide 979 heads, many of

which are to be applied to a majority or all of the main headings, after a point, as in the following examples :

B300	Architecture, General.
B300·1	Bibliography.
B300·2	Dictionaries.
B300·10	History.
C1506	Telescopic Lenses, General.
C1506·1	Bibliography.
C1506·10	History.

The point has no decimal significance. These multiply the number of places to something like 30,000; and there are further possibilities of expansion allowed by the notation. The weakness of the Categorical Tables lies in their extent partly, and partly in their character. There are too many of them, and a great number of the subjects are not general in character—are not form divisions—at all. For example, Printer's Ink cannot be said to be common; it is special to printing, and its position as a "category" removes it from its rightful place in the subdivision of that subject. This criticism could be enlarged greatly. Some idea of the exhaustive nature of the scheme may be gathered from the fact that Music, which has never before been worked out so thoroughly and well, has nearly 400 places assigned to it. Naval and Military Sciences receive nearly 200 places, and even such a subject as Photography receives 40. The subdivision is on a similar scale throughout. The arrangement under these various subdivisions defies

any criticism that we can bring to bear. Special emphasis is to be placed on the historical and geographical subdivisions ; the former are divided to the name of every ruler, and the latter are very minute. The United Kingdom in particular is divided as far as Boroughs and Royal Burghs.

34. The terminology of the scheme does not call for much remark. In the divisions of Biological Science abstruse scientific terms are generally used without explanations. This is not a fault, of course, but it would have facilitated the use of the scheme if the English translation had been added to each Latin term. Botany is particularly pedantic. As far as we can discover the headings are mutually exclusive, and there is a refreshing absence of terms of a critical or evaluative nature.

35. The notation is not a pure one ; it comprises letters and figures. That is to say, in arranging any topic two sequences have to be remembered. The author has adopted the rule that important subjects shall, as nearly as possible, each have a sequence of 1000 figures, from 000-999. Having decided this, he distributes among his main classes as many letters of the alphabet as will be necessary to provide one for every 1000 subdivisions ; thus Generalia is A, the Physical Sciences take B-C-D, Biological Science E-F, Ethnology and Medicine G-H, Economic Biology I, Philosophy J-K, Social and Political Science L, Language and Literature M, Literary Forms N, History and Geography O-W, and

Biography X. Generally speaking, the introduction of the letter and a new numerical sequence indicates a natural division in the classification, but sometimes the letter is merely an artificial landmark to another sequence of 1000 numbers. The numbers are to be read arithmetically, not decimally, and the average length of class number for 10,000 places is four symbols—a letter and three figures. In addition, any part of the scheme may be divided by any geographical number; thus Botany is E100, and the Botany of Russia may be indicated by this number with the addition of the class letter and the first figure for that country, as E100So; or if it be desirable to carry the local division further, the Botany of Warsaw would take the number for Botany plus that for Warsaw, as E100S188. In addition the Categorical Tables may be applied to indicate various forms. The categorical number follows the classification number, as we have shown already, and is separated from it by a point. Hence:—

E427	Orchids, General.
E427·1	Bibliography.
E427·2	Dictionaries.
E427·10	History.

and so on. If after all this numbering facility further division becomes necessary, the numbers in the main tables may be treated as decimals and figures added for as many places as required without in any way interfering with the sequence; thus:—

- K951 Catholic Apostolic Church.
 K9510 Christadelphians.
 K9511 Christian Strugglers.
 K952 Christian Endeavour Society.

These devices are quite simple, and although the notation is not a pure one, it is clear and limitlessly elastic. The longest symbols can be taken in at a glance.

36. The system is equipped with valuable aids in the shape of tables for alphabetizing under authors' names, and chronological tables worked out with great minuteness. These may usefully be applied to any other scheme of classification. The final and indispensable requirement of a practical scheme is also fulfilled by the provision of a very full and satisfactory Index. This Index refers every subject to one and one place only in the scheme. This is both its strength and weakness ; its strength because it refers to the place which should predominate, its weakness because it ignores the relations of various topics. A study of the tables disposes of the notion which the Index would create, that the system is " a one-place " system, locating each topic at one number only. It attempts to be this, but we think the task impossible. For example under " Trees " in the Index we have one reference E513, but, making for ourselves a partial relative index, we get this result :

Trees, General	E513
„ Forestry	I250
„ Fruit	I225
„ Topiary	I231

and none of these aspects is shown under "Trees," as we think should be the case. A comparison of the Index with Dewey's will further show our meaning better than the most lengthy explanation. It is some gain, however, to the study of classification that the impossible has been attempted, if only to demonstrate its impossibility. Finally, an Introduction dealing briefly with the theory of classification, and giving most useful hints on the application of the system, precedes the schedules. Not the least virtue of this Introduction is that it is written in reasonable English—a commonplace point perhaps, but one of some moment to the lover of the English language who has ground his teeth with indignation over its frantic and abominable maltreatment in Dewey's Introduction.

II. *Theoretical and Practical Classification*

37. It is a commonly received dictum that it matters little where in a scheme a subject is placed if it be thoroughly indexed. While the half-truth of this saying is indisputable, it is equally clear that one holding such a position is not perfectly cognizant of, or is forgetting, the whole functions of classification. The practical convenience of having one and only one place for a given group of literature, needs no very elaborate demonstration; but half the function of classification is showing the sequence of material. Surely no one holds the position that it does not matter where a title appears in a class

catalogue as long as the index is sound. Is not the advocate of the classified catalogue most dogmatic on the point that his cherished form shows not only actual subjects, but also their cognates and correlatives? The opposite position is that of the dictionary cataloguer, who assumes that the specific subject is everything, and the correlated subjects matter comparatively little. However, theories can always be pushed to logical conclusions which are worthless practically, or are at any rate less practical than some less logical conclusion would be. Dewey when he places Fiction between Drama and Essays in his division 800 is guilty of seeking theoretical perfection at the expense of utility. But we must be sure that the order we are accustomed to is the most useful. From our own experience we know that the broad grouping of the early systems of Mr. Brown, of Poetry and Drama in one or two alphabetic sequences of authors, irrespective of nationality, seemed to us a far more useful grouping than that of Dewey under national divisions. It is only when we apply Dewey to very extensive collections of books that we realise its superiority. Under the Quinn-Brown and Adjustable schemes one could find a given author more readily, but one could not review the complete strength of this or that literature; chronological sequence was not apparent, and in one of them the essential difference between the purely poetical and purely dramatic forms was completely ignored. Therefore, in a really great library

these systems would be scarcely more valuable than an arrangement of all classes of literature in one alphabetical sequence of authors. However, against this we must set the very practical fact that a great many users of Dewey revise the chronological arrangement out of his divisions as superfluous and adopt an alphabetic arrangement. This leaves the question of whether theoretical perfection and the greatest utility are compatible as nebulous as ever. All we can deduce from our own consideration of the question is that theoretical closeness should be sacrificed as rarely as possible. Its sacrifice is usually to make the finding of a book a little easier ; but the nearer our arrangement approximates to the order of ideas the nearer do we reach the ideal required by the specialist and exact student. The history, development, evolution—call it what you will—of the subject is of predominating importance, and we may claim that people who use libraries shall take the trouble to comprehend their arrangement. Every objection to the most exact arrangement would disappear if the ordinary reader would spend a single half-hour learning what it means—in short, if librarians realised that it is their duty not only to classify books, but also to teach readers the use of classification. Paradox as it may seem, this deduction is largely in favour of the Subject Classification. Although we have quarrelled with Mr. Brown for not breaking away from his scientific base more often, it will be remembered that we did so

for immediately practical reasons, and although every part of knowledge cannot always be assigned to a given base, most parts of knowledge can. Therefore the future is with the general idea expressed in Mr. Brown's scheme. The pity is that he has so far outraged his own theory in his *Generalia*.

III. *The Final Scheme of Classification*

38. This brings us to the question: Is Mr. Brown's system the final classification scheme? or, a wider question: Can any system be final? The answer seems to us to depend upon one or two simple considerations. Does this, or any scheme, answer the law of comprehensiveness; does it provide a place for the accumulations of knowledge and pseudo-knowledge, and will it embrace the discoveries of the future? If we agree that it does, we may say at once that this scheme may be adopted as the standard classification without fear. Classification is not dependent upon the fluctuations of knowledge to the extent that many would have us believe. The characteristics constituting the difference in great classes of knowledge are, generally speaking, known and defined. It may indeed be possible to conceive that in the group Zoology some other and far more subtle differentiating factor than the presence or absence of the backbone may be found at some future time to form the basis of the arrangement of the group. It is not probable though; if we had not recently lost

our scientific assurance over radium, we should pronounce it impossible. And similarly, in other groups of knowledge, the laws are demonstrated, are made standard. So whatever happens the broad divisions of classification will remain essentially unchanged, although they may alter their order, or require readjustment; and, as a consequence, the standard classification will only change in specific points, in its minutiae. Thus we arrive at the conclusion that owing to its comprehensiveness the Subject Classification may be the standard system, only to be met by the statement that the Expansive and Decimal systems are equally comprehensive. Here, then, the personal equation enters, one man prefers Dewey, another Cutter, another the Princeton or Perkins scheme, and so on. The reasons may be good or bad for these varying views; my point is that they are more personal than scientific. Indeed, do not some of our experts wrangle by the hour over such technical minutiae as whether numbers or letters make the most easily understandable sequence? We ourselves have been most dogmatic over it. Common agreement on this one point might be attainable, but no two real thinkers will ever agree upon the exact order of things; and a remark made at a recent meeting of the Association to the effect that every expert is himself the inventor of a scheme, although an overstatement, conveys a profound truth. As a result very few schemes are ever applied in their entirety; modifications, good or bad, are

almost invariably introduced. In America they do manage to be loyal to the schemes, but then the classifiers are women, and women are not affected by the faculty or disease of inventiveness. If men disagree about parts of schemes, clearly they will not agree about schemes as wholes. Nor is it desirable that they should ; every new scheme is a vital addition to our common stock of ideas, it represents supplementary thought and conclusions, and from a consideration of all schemes we come to the best decisions. A standard uniform scheme has advantages, but carries with it the fatal curse of stagnation ; indeed, as has been well said, uniformity is impossible among men who think at all. Mr. Brown has broken away from conventional groupings, he has called upon us to defend our old lines of demarcation between class and class. This alone is a good and valuable work—a step in advance of the present. But where the Subject Classification will score is in its completeness, its careful indexing, its simplicity, and the ease with which it may be used.

IV. *Epilogue*

39. The foregoing two chapters, when read in a greatly abbreviated form at the meeting of the Library Association on June 10, 1907, were received with much kindness by our hearers. The discussion, however, gave rise to a few valuable points to which it is convenient to refer here. Of these the most important was that raised by Mr. E. Wyndham

Hulme, a librarian and thinker whose great knowledge and long experience are entitled to profound respect. His argument may be analysed as follows :

It is not essential that a classification should provide class-marks for every conceivable topic, or indeed for any topic that has not been treated in print. It is quite sufficient if a book classification provides an accurate allotment for every aggregate of subject matter which is represented by books. The final order of the larger groups or families of literature can be changed at the will of the classifier without affecting the value of the classification, which depends upon the accuracy and sufficiency of the division and definition of the ultimate sub-classes. Book classification is not a science. It is an art, like that of fitting a child's puzzle together. You must be familiar with the pieces before you can put the puzzle together. It is, therefore, impossible for any satisfactory system of book classification to proceed from one person, for no librarian, however well-informed, can affect even a nodding acquaintance with all branches of literature.

The thesis here announced by Mr. Hulme is touched upon in the paper on *The Library of Congress Classification*, which is the one system that in any way approximates to it. Much that is involved

in the argument is self-evident and of necessity true.¹ A classification cannot possibly provide *actual* class marks for non-existent things, nor did the Canon require them. It can be so constructed, however, that it is possible to insert any new topic without dislocating the general order or the notation. The remainder of the argument turns upon the notion that books and ideas are different things, that a classification must be fitted to the actual books, and that an ideal order of ideas can never make a satisfactory system. We believe this theory creates a non-existent distinction between ideas and books, which, after all, are the expression of ideas, are their concrete form. We also think that it is quite impossible to make a satisfactory classification on the principle of the child's puzzle. There must be a predetermined plotting out of knowledge in which the divisions are mutually exclusive, and these mutually exclusive divisions cannot be obtained in any scheme unless one mind lays down the plan, or ideal basis of the system. As for the order of the main classes, it is a moot point whether its reshuffling at the will of the classifier does or does not make any difference to the practical value of the system. We are still inclined to think that an order which in some way represents the development of human thought makes for

¹ Mr. E. Wyndham Hulme has explained his theory of classification in a series of papers entitled *Principles of Book Classification*, *Library Association Record*, vol. xiii-xiv, 1911-12.

accuracy and exhaustiveness and has a definite mnemonic value.

40. Other points in discussion we have incorporated into this edition of the paper. Mainly they were objections made by Mr. James D. Stewart and Mr. A. Kirby Gill. Both of these gentlemen had applied the system, and had watched it in public use. They affirmed that readers readily apprehended and appreciated the method of the classification in tracing the arts and industries from their basic sciences.

41. Mr. Stewart also dealt with the Categorical Numbers. They were not universal in their application, but every one of them applied to several headings in the main classification, and their existence therefore was justified.

V. *A Brief Select Bibliography*

42. Already a certain amount of literature has been written upon *The Subject Classification*. The most important is listed here.

THE SYSTEM AND WORKS ON IT BY ITS AUTHOR

BROWN, J. D. *Subject Classification: with Tables, Indexes, etc., for the Sub-Division of Subjects* (1906). Ed. 2, 1914. Grafton. 15s. n.

The complete work, with descriptive introduction which is a valuable contribution to the methodology of classification, index, and tables for subdividing special subjects. The 1914 edition has been revised in several of its details.

BROWN, J. D. "The Subject Classification: Criticisms, Revisions and Adjustments." *The Library World*, vol. xii, pp. 41-45, 81-86, 121-24, 153-60.

Four articles, giving the results of three years' trial of the system, with several suggested changes of detail, which were incorporated into the 1914 edition. The fourth article is an important list of errata.

— *Manual of Library Economy*. Ed. 3, 1915. Grafton.

A description and an outline of the main classes and divisions.

— *The Small Library: a Guide to the Collection and Care of Books*. 1907. Pp. 84-88. Routledge. 2s. 6d.

REVIEWS AND CRITICISMS

BISHOP, W. W. [Review.] *The Library Journal*, vol. xxxi, pp. 836-38. December, 1906.

An appreciative descriptive review.

COUTTS, H. T. "The Subject Classification." *The Library Assistant*, vol. vi, pp. 305-14. April, 1909. Also issued as a separate pamphlet.

A descriptive account of the system and its application by a librarian who had been engaged in applying it for two years under the direction of J. D. Brown.

SAVAGE, E. A. "The Subject Classification." *The Library World*, vol. ix, pp. 48-53.

Descriptive and critical review.

WRIGHT, RICHARD. "Brown versus Dewey." In the

Library Assistant, vol. vii, pp. 227-37. October, 1910.

A comparison of the two systems class by class with results favourable to the Brown system.

APPLICATIONS

ISLINGTON PUBLIC LIBRARIES. *Select Catalogue and Guide: a Classified List of the Best Books on all Subjects in the Central, North and West Libraries.* 827 pp. Cr. 8vo. 1910. 1s. net.

Select catalogue arranged by Subject System, with index of subjects.

BOURNEMOUTH PUBLIC LIBRARIES. *Subject Index of the Books in the Central Lending Library.* 51 pp. 4to. 1912.

An alphabetical index to a library classified upon the Subject System.

CHAPTER IV

THE EXPANSIVE CLASSIFICATION

I. *The Philosophical Bases of the System*

43. THE philosophical bases of classification have always been a fruitful source of controversy and discussion; and the problems presented by such discussions are among the most interesting to the librarian with a speculative turn of mind. In his luminous synthesis of the subject Dr. Richardson arrives with certainty at the conclusion that the order of knowledge is the order of things, and that the order of classification is the order of things. Here he reaches a concrete and, it would seem, complete statement of classification order. But other and idealist thinkers do not find themselves in complete agreement. They ask, what is the order of things? Is there an essential visible or discoverable order in Nature? Is not all order merely the arrangement of *impressions* of external objects received by the mind that observes them? If this last question be answered in the affirmative, it becomes clear that as a man's vision is normal or otherwise, so will be his apprehension of the order of things. This somewhat Berkeleian view leads

to endless speculation, and usually ends in the adoption of the standpoint that classification is a working backward from the manifestation of a thing to its origin, rather than a forward working from origin to manifestation—the involucional as opposed to the evolutional order. To object, however, to the historical or evolutional order now that the progress of being from the simplest to the most complex forms has been traced with some degree of certainty, seems to us to ignore the achievements of science and the aid they give to the classifier. A parallel will illustrate our meaning. The physicist tells us that the colour of grass is pink, and that grass absorbs all colours but green, which it rejects, and thus green is thrown back to the eye. As, however, green is consistently thrown back, to all persons who are not colour blind grass gives the impression of greenness. Similarly, in the outer universe, the normal mind sees the order science declares to be existing: and classification for all practical purposes is a statement of the normal order of things rather than the absolute, idealist or metaphysical view.

44. Practical compromise becomes visible everywhere as we study book classification. Books do not conform to the special heads or divisions we find in a knowledge classification, and the natural order has to be adjusted to meet the conditions of the more or less composite form of books. "I believe, however," says Cutter, "that the maker of a

scheme for book arrangement is most likely to produce a work of permanent value if he keeps always before his mind a classification of knowledge."

45. Bearing this necessity of compromise in mind, we approach the Expansive Classification, and find that the author has adopted the historical or evolutionary basis. This is clear in the subdivisions of the main heads, but not so clear in the first division of knowledge into the parts which form the framework. Recently Mr. James Duff Brown has attempted to base the outlines of his scheme on the evolutionary order, and a comparison of the resultant outline with that of Cutter cannot fail to show wide differences. We place them in parallel columns, and we see that Mr. Brown's may be said to embrace Chaos, Force and Matter, Life, Mind and the Products of Mind; that is to say, the progress of the world from its unformed state into a complete factor in a completed universe.

	BROWN.	CUTTER.
	Generalia.	General Works.
<i>Matter</i>		Philosophy.
<i>and</i>	Physical Science.	Religion.
<i>Force.</i>		Biography.
	Biological Science.	History.
<i>Life.</i>	Ethnology and Medicine.	Geography and Travels.
	Economic Biology.	Social Sciences.
		Sciences and Arts.
<i>Mind.</i>	Philosophy and Religion.	Medicine.
	Social and Political Science.	Useful Arts, Technology.
		Fine Arts. Arts of Com-
	Language and Literature.	munication by Language.
<i>Record.</i>	Literary Forms.	
	History, Geography.	
	Biography.	

The standpoints are widely divergent. For example, Mr. Brown regards history from the outside, and calls it Record ; in Cutter it is fair to say that history is not regarded as the growth of communities, but as the communities themselves. A little consideration of this internal (but objective) view as opposed to the external (but subjective) view exhibited in the Subject Classification will show that there is an order in the main headings of the Expansive Classification which may be called logical. A savage becomes apprehensive of deity through a savage philosophy, and before he is aware of national identity or history he must be aware of individual identity or biography ; geography, or his knowledge of his immediate physical environment as it relates to his nation, would naturally be developed with the development of his national conscience. The social sciences, the economic relations of men to one another in a community, naturally spring out of the needs of a national social group—or social aggregate, to use Emil Reich's phrase ; the social bases of a nation being secured, it naturally develops industries and the embellishments of life ; hence the Sciences and Arts in their varying forms of medicine, industrial and technical arts, and then the fine arts. The final stage in national development is the sensible conserving of thoughts and records by the arts of writing, which reach their culminating point in pure literature. We see, therefore, that there is a logical

co-ordination of main headings in the Expansive system.

46. In the method of subdivision adopted the order is more apparent. The author's own explanation is lucid. "The Expansive Classification follows the evolutionary idea throughout, in natural history putting the parts of each subject in the order which that theory assigns to their appearance in creation. Its science proceeds from the molecular to the molar, from number and space through matter and force, to matter and life; its botany going up from cryptogams to phanerogams; its zoology from the protozoa to the primates, ending with anthropology. The book arts follow the history of the book from its production (by authorship, writing, printing and binding), through its distribution (by publishing and bookselling), to its storage and use in libraries, public and private, ending with its description, that is, bibliography suitably divided into general, national, subject and selective. Economics, too, have a natural order—population, production, distribution of the things produced, distribution of the returns, property, consumption. Fine arts are grouped into the arts of the solid—landscape gardening, architecture, sculpture, casting; and the arts of the plane—painting, engraving, etc.; and the mixed arts, being the smaller decorative and semi-industrial arts."¹ We can best test the claim by examining one of the divisions and its

¹ Cutter, *The Expansive Classification*. See Bibliography.

subdivisions and sections, and discovering how far they approximate to the accepted evolutionary order ; always remembering the limitations imposed by the form of books. The heading Natural Sciences divides into Mathematical Sciences, Physical Sciences and Natural History. This is logical. The Mathematical Sciences are the statement of the absolute mechanical laws of matter ; the Physical Sciences investigate matter ; and Natural History is the organised development of matter. Given a complete conception of the universe, the mind in arranging the factors in it may be assumed to proceed in this manner. Mathematics resolves itself into arithmetic, algebra, geometry, trigonometry, calculus. These, again, proceed in a well-defined order from simple numeration to the highest methods of mathematical computation in quaternions. The Physical Sciences divide into the general laws of matter and force, and then, in natural order, treat of the specific components of matter and force ; i.e. force, energy, electrics, optics, thermics, with their highly specialised developments, chemistry and astronomy. So far the order has been preserved. But a pause must be made at the subdivisions of Natural History. This divides into microscopy, geology, biology (with its great divisions botany, zoology, anthropology and the section of the latter, medicine). Could we transfer geology to a place next to astronomy, we could claim that the order had been maintained throughout the remaining

divisions. But as we cannot do this, we must assume that Natural History has a much wider connotation than that usually given it, and here includes all Nature except the laws and constitution of force and matter. This will make the order logical, but will not quite account for the separation between such co-ordinate sciences as astronomy and geology. The subdivision of biology is purely evolutionary, beginning with general laws of living matter, proceeding to botany as an earlier form of life than the animal as represented in zoology, to zoology, again, as preceding human life in anthropology, and to anthropology as necessarily preceding the ills that *ὁ ἀνθρώπος* is heir to, as dealt with in medicine. It may be assumed, therefore, that the evolutionary order has been adhered to with a commendable degree of faithfulness.

47. When we consider the final division (Seventh) of one of these subdivisions, astronomy, we find the order is still maintained, although, as appears in any system, every division does not necessarily modulate into the next, but there are constantly what may be called parallel developments or divisions. The synopsis is as follows: General Astronomy, History, Cosmogony, Spherical Astronomy, Theoretical Astronomy, Celestial Mechanics, Practical Astronomy, Astrophysics, Applied Astronomy and Nautical Astronomy. Here we may trace in logical sequence the first ideas of astronomy

developed through historical stages until the mechanics of the heavens has been sufficiently well ascertained to permit of its application to the material welfare of man. Cosmogony may be regarded as the early evolution of the subject; spherical and theoretical astronomy are to be regarded as parallel developments in the sequence, inasmuch that neither is a necessary consequence of the other. Celestial mechanics deals with the physical laws of the heavens and logically precedes the discussion of the methods by which these laws are ascertained. This method of examination may be continued to the end of the class, with the result that while a simple hierarchy of steps modulating one into the other cannot be affirmed, it can be established that the general principle governing the whole is evolutionary. Each of the smallest of the subdivisions we have mentioned divides again and again; for example, cosmogony runs thus:—

Cosmic evolution,
Nebula hypothesis,
La Place's theory,
Faye's theory,
Darwin's tidal reaction,

and so on; here we see definitely the evolutionary or historical method practically perfect.

48. Returning from these minute subdivisions to a glance at wider principles, we see the excellence of the order in what may be termed border-line

subjects. In any system it is impossible, however well the general headings may be co-ordinated, to arrange them so that the specific term with which any one of them ends modulates naturally into the next general head. For example, the Decimal Classification is practically without co-ordination in its main classes—is, in fact, most imperfect theoretically ; but, if we co-ordinate Sociology and History by bringing them side by side, Sociology being on the left, it will be found that the last subdivision of Sociology, customs of war, does not modulate readily into the next great group, History ; the difference between the extension of the first and specific term and that of the second and general one involves a leap abhorrent to the very idea of evolution. The Expansive scheme suffers equally from this ; and we must conclude that a bibliographical classification must therefore be a series of parallel orders : one for all main classes ; another for the divisions of each main class ; and another for the subdivisions of each division. Each of these orders may be an evolutionary one ; but it is clear that they cannot modulate into one another perfectly. But Cutter has recognised that there are subjects which do not form main headings themselves, but which lie between. His best examples are the Recreative Arts, which he recognises as partaking of the nature of Useful Arts and Fine Arts both, and, therefore, makes them a sort of transitive class between, unlike other systems, which usually arrange

them after Fine Arts and ignore the relation to Useful Arts. Again, in his subdivision of Fine and Recreative Arts, he recognises that music partakes of the nature of both of these, and makes this a transitive class.

49. We may now conclude in summary that the order of classification as found in the Expansive system is the normal order discovered in Nature by the evolutionist. We have seen that this is carried out with faithfulness throughout the main classes, and with necessary compromises throughout the divisions ; that the scheme is provided with satisfactory transitive classes ; and that the individual schedules are divided with scientific minuteness.

II. *The System and its Parts*

50. The system is described as one of seven schemes of classification in progressive order of fullness. The First Scheme is planned for a library of a few score of books or an even smaller number, and it consists of eight very broad and simple headings :—

- A General Works.
- B Philosophy and Religion.
- E Historical Sciences (biography, history, travel and geography all range together).
- H Social Sciences.
- L Sciences, and Arts, both useful and fine.
- X Language.
- Y Literature.
- YF Fiction.

As an alternative E may be divided into

- E Biography.
- F History.
- G Travels.

It is quite clear that this scheme is too broad for any but the smallest collection of books ; such a heterogeneous collection as one would get under L, for instance, would be impossible. In the Second Scheme Cutter expands in logical manner ; the first two classes remain as they were ; but History, Geography and Travels are now divided as far as continents and the three principal European countries. The Sciences and Arts have been divided into

- L Physical Sciences.
- M Natural History.
- Q Medicine.
- R Useful Arts.
- V Recreative Arts.
- Vv Fine Arts.

Considerable expansion has taken place. The same principle of subdivision is observed throughout the successive schemes, each in turn becoming much more specific than its predecessor. By the time the Fifth Scheme is reached the classification has been worked out almost sufficiently fully to be called minute ; and in the Seventh Scheme we have one of the most minute schemes of bibliographical classification in existence, suitable for application to a large municipal collection, or to the British Museum Library if need be.

51. One point is noticeable from the examples already given. In the use of the word "expansive" in connection with this scheme, we are not to infer that as the system develops from scheme to scheme, a corresponding development does not take place in the marking of the classes. Our theory of a flexible notation is one that will permit the intercalation of any topic or the expansion of any old one without a radical change in the existing notation. This is only true of the Expansive scheme as regards the broadest classes. A glance at the index for a specific subject will give, under Horse, the following markings :

¹L ²M ³O ⁵Pq ⁶Pm

Assuming the hypothetical case of a librarian who adopted the First Scheme and found it desirable to adopt successively the Six Schemes, he would be compelled to remodel his marking completely four times, and change it partly a fifth time. It is clear, too, that if the First Scheme had been adopted, all the books under L, Sciences and Arts, would, with the exception of Physical Sciences, change their symbols. This illustrates the importance of not adopting too simple a scheme for a library where expansion is in prospect.

52. Although the word "expansive" does not apply to the notation, it clearly applies to the subjects; the examples given are illustrations of the principles of division which are observed through-

out, and it is clear from them that each subject is expanded, and expanded logically.

53. The system is equipped with two important aids ; one, the Local List, an inherent part of the system, insomuch that it is impossible to do justice to the system without discussing it ; the other, the Author Mark, extraneous, but designed to enhance the value of the notation. Both these aids are developments of the notation, and we will therefore discuss the marking of the system to illustrate how, later, they relate to it. The base of the Expansive notation is the alphabet, A-Z ; and generally speaking it is a " pure " notation, i.e. composed solely of one kind of symbol. The classifier has, therefore, at his disposal twenty-six letters for marking twenty-six main divisions. Cutter, however, recognises that there are not twenty-six widely different departments of knowledge, and contents himself with ten. A table will illustrate his main headings and principal divisions, and the distribution of the letters of the alphabet in the skeleton of his notation :—

A	General Works.
B	Philosophy.
Br	Religion.
C	Christianity.
D	Historical Sciences.
E	Biography.
F	History.
G	Geography and Travels.
H	Social Sciences.

I	Demotics, Sociology.
J	Civics.
K	Legislation.
L	Sciences and Arts.
M	Natural History.
N	Botany.
O	Zoology.
R	Useful Arts, Technology.
S	Constructive Arts.
T	Fabricative Arts.
U	Art of War.
V	Athletic and Recreative Arts.
Vv	Fine Arts. Music.
W	Fine Arts.
X	Arts of Communication by Language.

The skeleton before us is that of the Sixth Scheme. It is clear from the point of view of division that all the headings are not of equal value ; for example, the giving of the symbol Br to Religion is a questionable economy in numbering material, when the border-line heading, Athletic and Recreative Arts (which may be said to be both useful and fine arts, but are neither exclusively), receives the single letter V ; and, if the value of the sequence were to be estimated from the notation, would indicate that Vv, the Fine Arts, were subdivisions of V, a palpable absurdity. But we are not criticising here. Eight main headings and fourteen important headings are obtained by one letter—twenty-two divisions in all. By the use of another letter we may subdivide each of these twenty-two twenty-six times,

making 577 subdivisions, and by the use of a third letter each of the 577 by another twenty-six. Thus by the use of a symbol as brief as AGD the classifier has command over 15,002 places ; and this method of subdivision can be expanded in the same way as much farther as wisdom seems to dictate ; its capabilities are infinite. Some definite rules are laid down by Cutter : letters are used to mark main classes and their local subdivisions, and for nothing else ; the auxiliary and geographical subdivisions are denoted by figures. The single figures, 1-9, are used for the form divisions which are general to a subject. Theory, Study, Bibliography, History, Dictionaries, Encyclopædias, Handbooks, Tables, Periodicals, Societies and Collections are each marked with the letter of the class followed by the form figure ; e.g. Bacon's *Dominion of the Air* (the history of aerial navigation) would receive the notation SZ·4=SZ Aerial navigation, ·4 History. The double figures, 11-99, are used exclusively to mark countries. The compiler of the scheme has realised that subjects differ as they apply to different countries, and it may be desirable to gather together all the books upon a topic as it applies to a country, either under the topic or under the country. The example Cutter uses is England, which is 45 ; thus, English Church History receives the mark D45, English History F45, the letters meaning ecclesiastical history and history respectively, the figures invariably England. The Author Mark, which we

have spoken of as the second aid to the system, is a mark whereby the individual author is indicated. It consists of the first initial of the author's name succeeded by a decimal figure so arranged that the names whose initials are followed by the first letters of the alphabet have the first numbers and those by later letters have later numbers ; i.e.

Gerry G16
 Glover G51
 Grote G89

Names beginning with the vowels and S use the first *two* letters of the name instead of the initial : and the first *three* letters are used for those beginning with Sc. The table of Cutter numbers is a separate compilation, and may be used with any scheme of classification. In its practical application, the author number is usually written or painted under the class number, or is separated from it by a space or by a point, e.g. :— $\frac{YF}{D36}$; or, YF D36; or, YF. D36= Defoe, *Robinson Crusoe*. The first is to be preferred for tags on the backs of books, the last for printing in catalogues. Individual works of an author may be further marked by adding in lower-case the initial letter of the first important word of the title ; as YF.D36r=Defoe, *Robinson Crusoe*.

54. We have now detailed the principal features of the system and may summarise them. It is in seven parts of progressive fullness ; a change from one scheme to the next involves considerable

changes in notation ; it has a pure notation with an alphabetic basis, and is capable of infinite expansion ; it is equipped with a special " form " marking for books which are general to a class ; it has a special Local List which is an intrinsic part of the system and permits the localising of any topic ; and it has an important auxiliary in a system of Author Marks for individualising authors and works.

III. *A Critical Review of the System*

55. The principles which govern the criticism of any bibliographical classification may be enumerated briefly. Its order and its correspondence to the order in Nature must be considered ; its universality ; its expansibility and minuteness ; the economy and simplicity of its notation ; its indexing ; and, throughout, its merits or demerits in comparison with other systems.

56. It is assumed that the first part of this thesis has proved indisputably that the Expansive Classification does follow a recognised order. The question of whether the order arbitrarily chosen is the absolute order in Nature is a question for the metaphysician ; but there is an evolutionary order clearly defined and logically maintained in the system. Regarded comparatively we think the Expansive shows very favourably ; it is philosophically consistent, its co-ordination is clear throughout. Setting beside it the main headings

of the Decimal and Subject systems we have this result :

E.C.	D.C.	S.C.
General Works.	General Works.	Generalia.
Philosophy.	Philosophy.	Physical Science.
Religion.	Religion.	Biological Science.
Social Sciences.	Sociology.	Ethnology.
Sciences and Arts.	Philology.	Economic Biology.
Useful Arts.	Science.	Philosophy and Religion.
Athletic and Recre- ative Arts.	Useful Arts.	Social and Political Science.
Fine Arts.	Fine Arts.	Language and Literature.
Arts of Communica- tion by Language.	Literature.	Literary Forms.
	History.	History, Geography. Biography.

This paradigm will demonstrate that the Expansive and Subject systems have each a logical and definite order, with distinct differences. The Decimal system, on the other hand, is not co-ordinate; Literature and Language, natural co-ordinates, are separated, as also are Sociology and History; this is probably one result of the decimal tens that have to be observed. Perhaps in these skeletons the Subject system has the best architectonic, but we have to remember that the arrangement is one of conceptions of knowledge, not of knowledge itself as in the Expansive. This was made clear in the early part of this essay.

57. It is a fundamental rule that a classification must be exhaustive in the enumeration of its parts. If the system is applied to a special subject it must provide places for all existing and all past and probable knowledge of that subject. If the appli-

cation is to be general this principle must be observed throughout all the divisions ; it must take the whole field of knowledge, or, to use a metaphysical term, of being, and provide places for everything. By this we do not mean that every possible object, concrete or abstract, in the universe must be enumerated in the schedules, but that the schedules must be so designed that places may be found for them, and that any new or forgotten topic may be intercalated at any point. A consideration of the headings in the last paragraph will discover that these nine great classes may be said to embrace the field of being. The minute analyses of the schedules under each of the headings are carried out in the Seventh expansion with such fineness that together they form a series of very special classifications, each capable of application to a very special collection of books ; and it is not too much to say that the co-ordination of these schedules makes an almost ideal universal system. Neither the Decimal nor the Subject scheme is worked out to anything like this minuteness, the Decimal being especially in need of expansion ; a fact which has brought about the classification of the Institut International of Brussels.

58. An ideal notation would be " pure," and, in its essentials, the Expansive reaches this ideal. As we have demonstrated, its notation is, generally speaking, one of letters only ; while the Subject uses letters and figures. But an ideal notation must

have other virtues ; it must be flexible, simple, have a mnemonic value, and—although this is not so essential—it must be brief. The flexibility of the Expansive notation is capable of easy demonstration ; its power of expansion is 26^{26} , a capability of division sufficiently near infinity for all purposes. Its mnemonic value is confined to the main classes and to its auxiliaries, the Form divisions and the Local List figures. A on the left of the notation is always General Works, and .2 in the Form divisions of a class is always the Bibliography of the subject, while 45 in the Local List is always England ; but a second letter, as in AA, BA, CA, has not a constant meaning. Still, the mnemonic features indicated are of great value. The brevity of the notation needs no further demonstration than that already given, that a symbol of three letters provides over fifteen thousand places. The question of simplicity is not so readily decided. It is argued, in comparing Cutter's notation with that of Dewey and Brown, that the latter, presenting as they do such symbols as 196, simple figures, and J92, a single letter and figures, are more easily carried in the mind and their sequence is much more readily detected. It is further argued that the figures stand for definite words, 196 signifying one, nine and six, while a sequence of letters stands for sounds merely. Moreover, one immediately appreciates the fact that 8 is followed by 9 or 87 by 88, but not so readily does one realise that Q precedes R or that RS precedes

RT ; one has to think longer over the letters. The argument is probably valid, but too much importance should not be attached to this point ; it is rarely that one is so hurried in seeking a book or an entry in a catalogue that one cannot spare the time for the brief mental process involved in distinguishing the sequence of letters. We may infer, therefore, that although the notation of the Expansive system is not so obviously sequent as that of the other two schemes, it is flexible, brief, and to some extent mnemonic.

59. The indexes to classification systems are of two kinds, specific and relative. The former gives to a system the appearance of providing only one place for a topic ; and such a system has never yet been compiled. But Mr. Brown, who adopts the specific form in his index to the Subject system, does so on the consideration that the classifier should place the book in his own mind before appealing to the index. Consequently, under Trees in the Subject and Decimal systems we have these entries :

S.C.	D.C.	
Trees E153	Trees botany	582
	fruit culture	634
	in streets, sanitation	622.48
	ornamental	715

It would seem that the Subject system placed all the various aspects of trees shown in the Decimal system under E153, but this is not so. In E153 we have trees as a form of vegetation in the botanical

division of Biological Science, but Forestry is I250 in Economic Biology and Domestic Arts; again, the ornamental treatment of trees, Topiary, is I231 in Landscape Gardening, and Fruit Trees are in I225. As a result one cannot use the Subject index intelligently without being familiar with the schedules. The example from the Decimal scheme is that of a relative index, one that includes all topics and aspects of topics. This is the plan followed in the Expansive index. The index to the first Six classifications—one index serves for all—is too brief for minute classification, but within its limits it is a relative index. One example will suffice :

Gold metallurgy	RFG
mining	RDG
political economy	HM

The Seventh classification, which has been published in sections, is equipped with elaborate sectional indexes, and a cumulative index of the whole will conclude the work. Hence it is possible to use any section, say Chemistry, separately for a special library without reference to the other main classes. These sectional indexes are relative, giving such various aspects of a single subject as

Race automobile	VIYR
boat	VGI
bicycle	VIWR
canoe	VAUW
course	VGO
foot	VIF

horse	VJR
odd	VLO
other animals than horses	VJV
potato	VIF
yacht	VGI

Beyond this the relative method could not further go. The index entries are frequently annotated with lucid explanations as

Rules of sport.

The rules of any one sport or game go with it.

It is quite clear that a cumulation of all these minute indexes will prove an invaluable aid to classification and will be the most extensive in the world, with the possible exception of the Brussels Index.

60. We shall not presume to assign to the Expansive Classification its place among bibliographical schemes. It has few devotees in this country—the best known is probably Mr. Thomas Aldred of Hackney—and, in consequence, very little practical attention has been given to it by critics of classification. Our enumeration of its chief points has convinced us of the scholarship of its method, the natural logic of its arrangement, its universality and hospitality, its economy, flexibility and reasonable simplicity of notation, and its admirable indexing. But it can only be fairly judged from a careful examination of the Seventh and final expansion, and its index will only be fully appreciated from the promised cumulative index ; the difficulty

of judging an incomplete scheme has been before us throughout. It is safe to say, however, that library methodology has received no more thorough, no more scholarly scheme, and none with greater possibilities of usefulness than the Expansive Classification.

IV. *A Brief Select Bibliography*

61. In this list are included only such books and articles as the author has been able to read or at least to examine carefully. Other references have been found but have been rejected; the following is therefore a "select" bibliography in the exact sense of the word, and forms, it is thought, a fairly complete course of reading on the system.

THE SYSTEM AND WORKS BY CUTTER

CUTTER, C. A. *Expansive Classification*, 1891-93.
Boston: C. A. Cutter.

The six schemes in progressive order of fullness; with a specific index to the whole. A sixteen-page introduction explains the history and application, and there is an epilogue dealing with order, date-letters, author marks, and making special note of the marking of voluminous authors and Greek and Latin authors.

— *Expansive Classification: Seventh Scheme*. Ed. W. P. Cutter. Boston.

This, the final expansion left unfinished at Cutter's death, has been carried on by his son and is still in progress. The various divisions have undergone complete revision at the hands of

specialist librarians, and the work is now "the most philosophical, logical and closely co-ordinated system in existence."—*Library World*.

CUTTER, C. A. "Expansive Classification." In *Transactions and Proceedings of the Second International Library Conference, London, 1897*. Pp. 84-88. 1898.

An exposition of the system written by its author at a time when it was practically unknown in England. It has the synopsis of a special scheme arranged for a Shakespeare Collection. Perhaps the best introduction to the system.

— "Shelf Classification of Music." *Library Journal*, vol. xxvii, pp. 68-72. 1902.

A table of the division Music with elaborate explanatory notes and an introduction.

— "Suitability of the Expansive Classification to College and Reference Libraries." *Library Journal*, vol. xxiv, c. pp. 41-49; "Discussion," c. pp. 154-56. 1899.

(1) A series of eulogies of the system; (2) an exposition of its application to libraries generally, which is really an argument in favour of its notation; and (3) its application, with examples, to college collections. Makes comparisons with the Decimal Classification.

— *Three Figure Alphabetic Order Table*. N.D. Northampton, Mass.: Pierce.

A table of the author numbers worked out minutely. An "Explanation of the Alphabetic Order Marks," which is virtually a reprint from the epilogue to the *Expansive Classification*, accompanies the tables.

OUTLINES AND INTRODUCTIONS

BROWN, J. D. *Library Classification and Cataloguing*. Pp. 63-68. 1912. Grafton. 7s. 6d. n.

A brief introduction and outline.

— *Manual of Library Economy*. Pp. 260-64. 1903 ; pp. 192-94. 1907. New edition, 1915. London : Grafton. 8s. 6d. n.

A useful practical introduction and an outline.

— "Cutter's Expansive Classification." *The Library*, vol. x, pp. 96, 286. 1898.

An outline and a few practical notes.

RICHARDSON, E. C. *Classification*. Pp. 201-7. 1901. Ed. 2. 1912. Boston : Scribners. London : Grafton. 6s. 3d. n.

A brief bibliography of the scheme, an outline and a history of it, with random examples illustrating the notation.

STEARNS, L. E. *Essentials in Library Administration*. Pp. 53-55. 1905. Boston : A.L.A. Publishing Board. London : Grafton. 1s. 3d. n.

An outline of the system, simplified for application to a small library.

CRITICISMS

ALDRED, THOMAS. "The Expansive Classification." *Library Association Record*, vol. vii, pp. 207-19. 1905 ; Discussion, pp. 196-201.

A brief in favour of the system, dealing only incidentally with classification, but laying special emphasis upon the notation ; the discussion revolved largely around the simplicity of the notation.

KEPHART, HORACE. "Classification." In DEWEY, MELVIL, (Ed.). *Papers prepared for the World's Library Congress*, 1893. Pp. 861-97. 1896. Washington: Government Printing Office.

A table of a large number of American libraries showing classifications in use with comments by the librarians; with a brief theoretical introduction and a valuable list of literature on all systems of classification in use at the date of publication.

AN APPLICATION OF THE SYSTEM

AMERICAN LIBRARY ASSOCIATION. *Catalogue of the A.L.A. Library: Five Thousand Volumes for a Popular Library*. 1893. Washington: Government Printing Office.

The entries on pp. 145-256 are arranged according to the Expansive system, and are followed by sample pages of author and subject indexes respectively.

CHAPTER V

THE DEWEY DECIMAL CLASSIFICATION AFTER THIRTY YEARS

I. *Some Preliminaries*

62. THERE are few subjects about which it is so possible to weave a web of philosophical moonshine as classification ; a web so intangible and delicate as to give a meretricious mystery to what is after all a very simple matter. It was a signal service George Henry Lewes did for philosophy when in his *History of Philosophy* he made it clear that the subtleties of the philosopher were in analysis not so wonderfully subtle after all. The mystery, we suppose, arises merely because every science and art has a tendency to acquire a phraseology of its own which in time becomes a real veil between the uninitiated and the subject. Experience of the work of students of classification convinces us of a tendency on the part of those who approach classification to create imaginary difficulties. Classification is an art, and one sign of its progress is its gradual accumulation of phrases and terms which give rise to the notions of difficulty to which we refer. The beginner who takes up the study is rebuffed by these things, think-

ing here is a subject as difficult as the philosophy of the Upanishads, forgetting the while that the Upanishads are a work of the human mind, and that whatever is human in origin is either understandable with more or less effort or is negligible. Every essential truth may be comprehended if one but makes the effort to comprehend. Classification is merely a mapping out of human experiences, perfectly intelligible. Whatever order the designer of the classification may adopt, whatever lines of latitude and longitude may form the basis of the map he constructs—and the direction of these has varied considerably—the resultant map can only be a setting forth of knowledge, revealed and experienced, physically or spiritually. But we ought to define the matter of classification a little more fully. It is an arrangement of things, it is true, but in its fullest statement it is an arrangement of *being*. We use the word in the metaphysical sense—the simplest of senses—it is an arrangement of all things tangible or intangible, all things present, past and future, things that have or may have existence upon every plane of thought. When this is realised, the question, Is such and such a scheme of classification the final one? will provoke a tolerant smile. Nothing is so conducive to mental humility as a study of the history of classification. A glance back at the co-ordinations of knowledge proposed by Porphyry, Callimachus or Bacon, or the charts, more specifically bibliographical, of Gesner, Brunet

or Edward Edwards, emphasises what is patent to every thinker—the fluidity of human ideas. Here were men, conversant apparently with the ramifications of knowledge in their respective centuries, setting out maps of universal learning, but, like the geographical map of Ptolemy, they are landmarks merely on the road behind ; thought has gone on. Looking at these from our modern standpoint we see how inadequate each and all are to embrace our conceptions of knowledge ; we see how each is an expansion or modification of the others ; and by following the study we see, too, how at the middle of the nineteenth century the entire scheme of classification shows a radical difference from that of classification before the popular promulgation of the theory of evolution. Our method of viewing being was as entirely altered by that theory as the ancient theory of astronomy was altered by the discoveries of Copernicus, and we are a little apt to be arrogant over the matter. But could we realise the intellectual position of the scholar prior to Spencer and Darwin our arrogance would be subdued. No doubt the lines of knowledge were as settled for him in his generation as they are for us in ours ; but it is not too much to assume that a newer theory of the universe will one day supersede that of the evolutionist ; historic experience should warn us that this may be so ; especially when we realise that the whole of our so-called empirical knowledge, from the propositions of Euclid to the atomic structure

of the universe, is built upon a series of assumptions incapable of demonstration and liable to disproof. Classification can only achieve what Bacon attempted in his *Advancement of Learning*—the finest book of classification ever written, and one, we would, had we authority, compel every librarian to read—can only map out knowledge in the light of the experience of its own generation, with the tolerable certainty that a future generation will study the map with the curiosity of the antiquarian. In the widest spheres of knowledge the discoveries of psychology and of the workings of psychic forces may bring changes, in fact, are bringing them, and all classification is as unstable in the end as is its subject, knowledge. One branch of biological classification, that of botany, is sufficient to demonstrate this. The system of Aristotle gave place to that of Pliny, Pliny to many a later adapter until Linnæus fixed it awhile, then came the natural system of Bentham which is now superseded by the so-called German system; and this, we suppose, only waits to be superseded by some other arrangement. As this applies to philosophical classification, so it applies to bibliographical classification; for the two things are co-extensive. Bibliographers are fond of insisting upon differences between the two, but bibliographical classification is only philosophical classification made practical; the differences are superficial.

“Any intelligent man,” says Macaulay, “may

now, by resolutely applying himself for a few years to mathematics, learn more than the great Newton knew after half a century of study and meditation."¹ An Aristotle or a Roger Bacon could compass the entire learning of his day ; but a mind capable of grasping all modern knowledge is inconceivable. A full bibliographical classification must necessarily map out all modern knowledge ; in fact, " the value of such a system is in direct ratio to the generalness of its use."² It follows, therefore, that no single worker can hope to construct a perfectly satisfactory general classification in its entirety, because such a classification must be a series of co-ordinated special classifications. The most satisfactory system of bibliographical classification—we mean the Expansive system—is the work of a number of specialists, and only in this way can a great system be constructed.

These reflections are not so wide of our subject as may be thought. They show us anew the field in which the classifier has to work, and the apprehension of the fluidity of knowledge and its constant expansion, enables us to understand why the Dewey system, in less than forty years, has fallen behind the march of knowledge.

II. *The Decimal Classification*

63. The Decimal Classification was published by Melvil Dewey in 1876 ; it is therefore about thirty-

¹ " Essay on Milton."

² Richardson's *Classification*.

four years old. It was by no means the first decimal classification ; Edward Edwards has shown that the decimal principle in classification was “ well known in European libraries for scores of years ” before Nathaniel B. Shurtleff published his treatise on *A Decimal System for the Arrangement and Administration of Libraries*, at Boston in 1856. Nor does Dewey claim any priority of invention. His first edition consisted of twelve pages of tables containing a thousand sections, and a relative index. It is amusing in these days of the expanded Dewey of the Institut International de Bibliographie to read that this modest skeleton “ was criticised as being altogether too elaborate for use even in a large library.” How dogmatic is the genus librarian ! We remember similar remarks about the Adjustable system, similar remarks are being made to-day about the Brussels Expansion of Dewey and the Seventh Expansion of Cutter. We wonder what would be said if we could see the tables of the classification for the twenty-first century.

Although Dewey did not claim to have invented decimal bibliographical classification, he did claim originality for the Relative Index ; indeed, this adaptation of the well-known index to the tables of a classification scheme was an extremely ingenious idea. Here at a topic word were assembled all the aspects of the subject exhibited by the schedules ; at any rate, that was the ideal, and though it was not entirely realised, the failure to realise it is only

another proof that humanly speaking perfection is unattainable.¹ This Relative Index, which furnished for the first time a single comprehensive system of classification with the means of rapid reference, and gave a fair certainty of consistence in locating books, made for the popularity of the system, and, as is the experience of all of us whatever the classification we use, new divisions were soon required. Expanded editions appeared in 1885, 1888, 1891, 1899, and the edition we now use, the sixth, has no less than 612 pages. This, as will be seen presently, is still practically inadequate to modern demands, apart from the fact that it is inadequate in other respects. Another edition is in progress²; certain classes are at this moment in the press, and particular attention will be paid to modernising the divisions of Science. It is clear from this demand that the work has become popular. We cannot say what its vogue is in America except that it is very large; Richardson estimates it at "some thousands"; but, in our own islands out of 232 libraries which claim to be classified, 139 are classified by this system. On the Continent and in the Colonies it has also a vogue, and the British Museum catalogues English, French, German, Italian and Spanish material dealing with the system. Moreover, the

¹ *Vide* the articles by Mr. J. D. Brown on "The Subject Classification," in the *Library World*, August, 1909, *et seq.*

² This seventh edition appeared in 1911, and is a partial and not a complete revision of the system. Apparently a progressive expansion of the tables is proposed.

adoption of the Dewey system by the Institut International de Bibliographie, and by the Concilium Bibliographicum of Zurich, has led to its adoption for several important trade bibliographies, and has fixed it as the premier bibliographical scheme for some years to come at least.

64. The apparent framework of the Dewey system is the decimal system of Arabic numerals ; we say apparent, because we should like to say something about the slough of misconception critics have fallen into who have attacked the system without due consideration. "The Dewey system," say they, "is rigidly conditioned by the procrustean bed of the decimal ten." Critics of this type apparently do not realise the meaning of the word "procrustean,"—it means rigid inflexibility, and the phrase quoted evidently is intended to convey that the classification is limited to ten main classes, and divisions in multiples of tens. We have noticed that a great many writers endeavour to make up in fine phrases for what they lack in wisdom. Such a phrase as the one quoted has a paralysing effect on the listener whose mind is not nimble enough to recognise that it is a mere contradiction in terms. Anything more flexible and less procrustean than the decimal treatment of Arabic numbers it is impossible to find. What does the decimal stand for in this system? If you examine the Subject Classification, you will find it has a bed of four rather than ten divisions ; if the Expansive you will

find it has ten. Each of these schemes claims a wider base than Dewey ; in reality neither can substantiate such a claim ; for, to some extent, they are all modifications of Bacon's intellectual chart, and Bacon has a base of three main classes. It is again another evidence of the confusion of critics who, both in England and America, seem unable to distinguish between notation and classification, and are far less able to separate them and review them independently. It seems to us that even designers of classifications, who ought to know better, have muddled these points. Surely the truth amounts to no more than this. The classifier spreads out before him the whole field of knowledge, having previously determined upon a certain order—evolutionary, involutory, merely arbitrary, or whatever seems most fitting. He then determines that a number of signposts will give facility in traversing the maps. These signposts he calls main classes ; but whether he have three or thirty such signposts alters not one jot the order of the map. A main class, then, is nothing more than a guide which indicates a certain part of the field ; and the only rule the classifier has to observe is that each of the parts of the field shall be self-contained, be exhaustive, and as far as possible exclude all material in every other part. Thus, then, from the purely classification point of view the number or fewness of the main classes is of small consequence. But it is of great consequence from the point of view

of notation, for the length of the notation symbol increases in inverse ratio to the number of main classes. Hence, if there were only five main classes in Dewey the notation would be twice as long—in the subdivisions—as it is at the present. Those who still think that the order or the division is rigidly limited by the notation would do well to consider another decimal classification, that of the Bodleian Library, 1888. For the outline only the figures 90 to 399 are used, and these numbers are distributed through the classes as follows :

- 90-99 Natural, Comparative and Heathen Religion and Folk-lore.
- 100-149 Theology.
- 150-169 Medicine.
- 170-179 Arts and Trades.
- 180-199 Natural Science.
- 200-209 Travel.
- 210-229 Biography, Heraldry and History.
- 230-248 Sociology.
- 250-299 Literature (including Bibliography).
- 301-329 Language.
- 340-399 Miscellaneous.

The classes are divided decimally after the manner of Dewey. The following are a few random examples illustrating the intercalation of topics.

- 257 Writing and Illumination : General.
- 2571 Particular Scripts.
- 25782 Specimens of Autographs.
- 25783 Catalogues of Autographs.
- 25784 Handwriting as an Index to Character.
- 25785 Shorthand.
- 25789 Cypher.
- 257899 Punctuation.

The order of the Bodleian scheme is outside our scope, but it is a working classification, and, this is the important point, it is a classification the arrangement of which is more or less independent of where the tens fall in the decimal sequence.

65. It has been suggested that as the ten classes of the Dewey stand at present, certain classes, as Literature and History, are cumbrous. Although this idea of cumbrousness is simply the dread of long notations which inspires nearly all English librarians, it is certainly easy to obtain all the advantages of decimal division, by dropping the numbers 0-9 for the main classes, and substituting letters. The result will be to give a possibility of twenty-six main classes instead of ten, and the existing method of decimal division can be repeated under several of the letters. We could have :

- | | | | |
|-----|-----------------|---|--|
| 000 | General Works . | A | General Works. |
| | | B | Bibliography and Library Economy. |
| 100 | Philosophy . | C | Philosophy. |
| | | D | Natural Religion. |
| 200 | Religion . | E | Revealed Religion and its Scriptures. |
| | | F | Non-Christian Religion and its Scriptures. |
| 300 | Sociology . | G | Sociology. |
| | | H | Government and Administration. |
| | | I | Law. |
| | | J | Commerce. |
| | | K | Education. |
| | | L | Customs. |

400 Philology .	. M Philology.
500 Science .	. N Science.
	O Mathematical and Physical Sciences.
	P Biological Sciences.
600 Useful Arts .	. Q Useful Arts.
700 Fine and Recreative Arts .	R Fine Arts.
	. S Recreative Arts.
800 Literature .	. T Literature.
	U Poetry.
	V Drama.
900 History .	. W Topography and Travel.
	X History.
	Y Biography.
	Z Fiction.

The notation would read as follows :

<i>History of England</i> X42.
<i>History of Anglo-Saxon England</i> X42.01.
<i>Brown's Manual of Library Economy</i>	B20.2.
<i>Jones's Travels in England</i> W42, etc.

The same notations would apply to Philology and Literature, to History and Travel ; and the form divisions—Dewey's invariable

- 01 Philosophy, Theories, etc.
- 02 Compend, Outlines.
- 03 Dictionaries, Encyclopædias.
- 04 Essays, Lectures, Letters, etc.
- 05 Periodicals.
- 06 Societies, Associations, Transactions, Reports, etc.
- 07 Education, Study, Teaching, Training, etc.
- 08 Polygraphy, Collections, etc.
- 09 History.

would apply to each of the headings. This in the general outline is the sort of thing Cutter has done in the Expansive system, and critics are under the impression that there are twenty-six definite divisions here. There are still only ten. A method resembling this is used in Nelson's *Standard Books*, and, like many recent unacknowledged contributions to bibliography, is a suggestion made by Mr. Jast, who unfortunately only too rarely gives us his suggestions by his own pen. The working out here is our own.

66. We are not sure that such an adjustment is an improvement on the existing arrangement ; but it answers many objections. Personally we are inclined to believe the purely decimal notation superior to any form yet proposed. Man habitually thinks in numbers, and the decimal order of numbers gains wider recognition every day in all forms of calculation. Eight figures are more easily remembered than four letters. Think of the symbol for the year 1748 in terms of AMLX instead of the figures, and you will recognise how immeasurably more comprehensible are the figures.

67. The defects of the Dewey system do not arise out of the procrustean bed of the decimal tens, or from the number of the main classes ; they are the far graver defects of order.

III. *Criticism*

68. On the threshold of the system Dewey attempts to disarm criticism. "Practical utility and economy are the key-notes of the entire system, and no theoretical refinement has been allowed to modify the scheme, if it would detract from its usefulness or add to its cost."¹ This is his thesis, and it is an excellent one; but we have to decide whether the retention of theoretical refinements would increase cost or reduce utility. And in one or two cases it is quite clear it would not. In the general outline Dewey admits his indebtedness to W. J. Harris's *Inverted Baconian*² scheme which in skeleton is as follows:

A Science—

Philosophy.

Religion.

Social and Political Science.

Natural Science and Useful Arts.

B Art—

Fine Art.

Poetry.

Fiction.

Literary Miscellany.

¹ *Decimal Classification*, Introd., p. 7.

² The term "Inverted Baconian," popularised by Edward Edwards, has puzzled many students. Mr. Brown quoted it in his little *Manual of Library Classification* without an explanation. Of course it merely means that a scheme has taken Bacon's order and turned it round the other way.

C History—

Geography and Travel.

Civil History.

Biography.

D Miscellany.

Bacon's scheme—which ought to be more widely and sympathetically studied than it is—has three main classes corresponding to the human faculties of Memory, Imagination, and Reason, and is in outline as follows :

I. History (Memory)—

Natural History—

Generations (Physics, Physical Geography, Species, etc.).

Praetergenerations (Monsters).

Arts.

Civil History—

Ecclesiastical.

Literary.

Civil History Proper.

II. Poesy (Imagination)—

Narrative.

Dramatic.

Paraboliical.

III. Science or Philosophy (Reason)—

Philosophy—

Divine Philosophy (Natural Theology).

Natural Philosophy.

Speculative—

Physic.

Metaphysic.

Operative—

Mechanic.

Magic.

- Human Philosophy (Anthropology)—
 - Philosophy of Humanity—
 - Human Physiology (or Physical Anthropology).
 - Human Psychology—
 - Logic.
 - Ethics.
 - Civil Philosophy (Modern Sociology)—
 - Society (Social Relations).
 - Commerce (Economics).
 - Government (Politics).
- Theology (Revealed Religion).

If we invert this order and make it Philosophy, Poetry, History, we have the first skeleton of the Dewey scheme; and a process of very simple reasoning, *allowing for the modern connotation of Bacon's terms*, will adjust the remaining classes under these three headings :

Works of Reason—Bacon's <i>Philosophy</i>	Philosophy. Religion. Sociology. Philology. Science. Useful Arts.
Works of Imagination—Bacon's <i>Poesy</i>	Fine Arts. Literature.
Works of Memory—Bacon's <i>History</i>	Travel. Biography. History.

69. The interdependence of the systems, which Richardson declares "is hardly to be discovered," seems fairly clear. However, it is a practical ques-

tion whether the order of knowledge satisfactory in Bacon's time is quite so satisfactory now. If we take the ten classes as they stand, the often-remarked separation of the raw material of history, Sociology, from its more organised material History, is at once apparent, and more so the separation of the raw material of literature, Language, from Literature. It is difficult on any grounds of theory or practice to justify this separation, and it cannot be said to be justified by "practical utility or economy." It is merely clumsy, unless appeal is made to the Baconian arrangement of the scheme just described. We give Dewey's order of main classes and a possible order :

PRESENT ORDER	SUGGESTED ORDER
000 General Works.	000 General Works.
100 Philosophy.	100 Philosophy.
200 Religion.	200 Religion.
300 Sociology.	300 Science.
400 Philology.	400 Useful Arts.
500 Science.	500 Fine Arts.
600 Useful Arts.	600 Philology.
700 Fine Arts.	700 Literature.
800 Literature.	800 Sociology.
900 History.	900 History.

70. But the order of the main classes is a minor defect compared with that of the divisions of many of the main classes. Time and space forbid a very detailed examination of these ; and we shall content ourselves with pointing out a few of them. One of the best subjects set in the Library Associa-

tion examination in classification in recent years was that set in 1907: "A critical examination of Dewey's 100, Philosophy." It bristles with faults: Cross division, lack of exclusiveness in terms, want of order, logical or otherwise. Here is the outline:

- 1 Philosophy.
- 11 Metaphysics.
- 12 Metaphysical Topics.
- 13 Mind and Body.
- 14 Philosophical Systems.
- 15 Mental Faculties.
- 16 Logic: Dialectics.
- 17 Ethics.
- 18 Ancient Philosophers.
- 19 Modern Philosophers.

A more indefensible jumbling it would be difficult to discover. Philosophy is the study of a right rule of life, and its culmination is an ethic. Hence Ethics ought to be last in the order. The cognates Mind and Body and Mental Faculties have sandwiched between them Philosophical Systems, which itself is unnecessarily separated from Ancient and Modern Philosophers. Logic, again, in no way modulates into Ethics. (Metaphysical Topics is merely an endeavour to avoid repeating the word Metaphysics.) The subjects separated have differences, of course, but their likeness to one another is greater than their likeness to the other headings in the class. Theoretically the class should be arranged in some such order as this: ¹

¹ Since the above was written the Library of Congress *Outline Scheme of Classes*, 1910, has come to hand, in which the order for Philosophy coincides very closely with that suggested here.

- 1 Philosophy.
- 11 Logic.
- 12-13 Metaphysics.
- 14 Mental Faculties.
- 15 Mind and Body.
- 16 Philosophical Systems.
- 17 Ancient Philosophers.
- 18 Modern Philosophers.
- 19 Ethics.

putting pure philosophy before the material on which it works, the agents directing it, and its material results ; and this might have been done without complicating or increasing the cost of the system. Several anomalies occur in the sections of the class. It is interesting to know that Astrology, Palmistry and Spiritism are all either Delusions, Witchcraft or Magic ; there is a satisfactory finality about it, but such placing is extremely bad classification ; for classification should not exhibit a critical view of any subject in this way. Again, a glance at the sections of Ancient and Modern Philosophers will show how the author has mixed up systems and philosophers in a puzzling fashion ; and the nine philosophers under each of the headings American, British, German, French and so on, are a mathematical division of each school almost bad enough to justify the remark about the procrustean bed of the system.¹

¹ We would suggest to any student who may do us the honour of reading this paper, that a rearrangement of other of the classes of Dewey, in accordance with a determined characteristic, would form an admirable exercise in theoretical classification.

71. We might spend a great deal of time in criticising 200, Religion, but we pass on rapidly with the remark that one heading for General Religion, one for Natural Theology, seven for the Bible and Christian subjects, and one for all non-Christian religions seem quite out of perspective. There is no place for general works on Christianity except under Apologetics, which of course is a mode of treating the subject. Class 300, Sociology, is unfortunate in including folk-lore, certain branches of which really belong to Ethnic Religion, and certain other branches to Literature. Its divisions of 400, Philology, and 800, Literature, are in the wrong order. Instead of showing the development of languages, they begin with the most modern, American, and go backward through the classical to the early Aryan languages and primitive speech. It would take far too long to criticise 500, Natural and Mathematical Science. No doubt it was fairly sound when designed, but it is obsolete in more than half of the divisions, and needs an enormous amount of expansion in the Biological Sciences. 600, Useful Arts, is a hybrid collection beginning with the highly specialised art of Medicine, running through Agriculture, Domestic Economy, Communication, Manufactures, Mechanic Trades to Building. Every one of these sections needs expansion in the light of modern research and industry, except perhaps Building, which is worked out with special fullness. To indicate minor omissions would be absurd, but

the average classifier would find it rather difficult to place such a book as Rees's *Grocery Trade: Its History and Romance* satisfactorily. Much the same criticism applies to 700, Fine Arts. Landscape Gardening is a division, and is consequently separate from 630, Agriculture. This is a case where Dewey has sacrificed "practical utility and economy" to theory, as in practice the landscape gardener and the kitchen gardener are often one. Mr. Brown's arrangement of Flower Gardens, Fruit Gardens, Market and Kitchen Gardens, and Landscape Gardening in one sequence under Agriculture is more to be commended. The division 770, Photography, is naturally quite obsolete, and an alphabetical arrangement of the processes under this heading would fitly supersede the present almost useless arrangement. A similar method could be adapted to 790, the division which deals in a cumbrous and ineffective way with Amusements. Class 900, History, is the most extensive of the classes. It embraces Geography and Travels, Biography, and Ancient and Modern History. Although Geography and History are enclosed within the class, they are carefully separated, which is a distinct defect, as clearly the books about the past of a country ought immediately to be followed by those about its present. There is a want of balance in the class. The emphasis here, as in Sociology and Literature, is naturally, considering the origin of the scheme, American; but, from the English point of view, the trivialities of a country

with little history and less literature, are quite unnecessary, while many details of European and other history are omitted. It never seems to have occurred to Dewey that books existed on such an insignificant subject as the British Empire as a whole, or upon the Colonies or Great Britain as a whole ; and we are reduced to placing books on the British Empire under the England division of Europe—an utterly absurd place. Biography is in perfectly logical order in the scheme, though some librarians have found it convenient to remove it and letter it B and arrange the books alphabetically by the name of the biographee ; similar adjustments of Fiction have been made.

72. To conclude this criticism. There is a lack of comprehensive general heads throughout the classification. We have instanced General Christianity, Great Britain, the British Empire ; other omissions are familiar to users of the scheme. We should like to have another growl at the Introduction, which is written in a horrible form of phonetics, offensive to the eye, and regardless of historical etymology.

IV. *Some Conclusions*

73. It has been shown conclusively that the Dewey scheme is vulnerable in many places ; but it is not fatally so. Its enormous elasticity has provoked the admiration of users everywhere. You may alter the order of its classes ; new headings may be inserted ; classes here and there may be

omitted ; but the scheme always closes up and is workable in almost any circumstances. Proof of this fact may be drawn from the number of modifications and expansions which have appeared since its first publication. First of these of course is the great Brussels expansion, a monument of minute research and special knowledge, in which, as you know, the tables have been expanded in many of the main classes in a proportion of at least ten pages to one of the original. Then there is the minute expansion of the tables made by the Concilium Bibliographicum of Zurich for its card index of zoological literature. (A copy of this card index is in the Manchester Museum.)

74. We think a wider use of the form marks designed by the Institute, in connexion with the orthodox Dewey system, to be desirable, especially in the cataloguing of small and specific literature, which deals with more minute topics than the generality of books, and because it is small is often fugitive and elusive, and easily overlooked. Such a use would bring into action the many large and useless, because inaccessible, collections of pamphlets which exist in our libraries. Especially would we suggest the more frequent use of the geographical curves, as adopted in the Cardiff and Newcastle-upon-Tyne catalogues. The best application of these marks is to be found in these catalogues and in the *Best Books* list of our Association for 1908. The marks, which are an admirable auxiliary to the

system, are known to you, and have been expounded in a lucid and workmanlike manner by Mr. Hopwood.¹ We repeat them here in order to complete this essay.

1. Form divisions
(generalial) (01-09) The original Dewey form marks within curves.
2. Place (the geographical bracket (2-9)) . Dewey's divisions of 900, but substituting the curve for the historical 9.
3. Time " 1907 " Date simply enclosed in inverted commas.
4. Language =2-9 Mark of equality followed by division number as in Dewey's Philology.
5. Relation to other subjects . : A colon separates subjects.
6. Relation to detail of same subject . - A dash separates the detail from the subject.
7. Proper names A-Z alphabetic order, as in poetry or other form classes.
8. } Subject Divisions . { 00 } Special forms in connexion with special tables.
9. } . { 01 } As Dewey's numbers.
10. } . { 1-9 } As Dewey's numbers.

In addition a cross + shows a work treats two subjects, as 9 (42) + (44) marks a work dealing with England and France.

75. In America several special libraries have expanded the tables of their particular subjects

¹ See Bibliography (section 78).—We have made use of Mr. Hopwood's paper in connexion with this paragraph.

enormously. In England we have the Sion College classification, which is a modification for a special library, and more recently we have the minute scheme for Fine Arts and Allied Subjects worked out at the South Kensington Museum. Then, every second librarian who uses the scheme has modified it in some way or other. One has taken Travel out of history, and substituting the symbol T for the 9 has marked it with the historical numbers. Another has amalgamated Philology with Literature and has used the divisions of 300 for the History and Description of Great Britain. And these are only a few of the vicissitudes of the classification. It would seem, then, that a system which has gained so great a vogue and which lends itself to so many variations and is practicable in each and all, must have peculiar virtues. It has. It was, as already remarked, the first classification to be equipped with a satisfactory index which made it intelligible alike to librarian and reader. It first developed those useful mnemonic forms which make it so easy to learn. Whatever may be the faults of its order, it is equipped with the simplest, most flexible of existing notations. The same elasticity extends to its classes ; topics can be inserted almost anywhere without dislocating its sequence ; and we believe that every fault we have mentioned, and a great many we have not mentioned, can be rectified without great trouble or cost. The full beauty of the system is rarely seen in England. There is a

curious idea prevalent that the full Dewey is too minute for libraries under 10,000 volumes ; and the abridged version is largely used. This seems to us an indefensible position. It is impossible to classify satisfactorily by the abridged without reference to the full tables, and several libraries which are claimed to be classified by the system are without a copy of the full tables. But why do we use the abridged scheme at all ? Simply because we are afraid of a lengthy notation ; that we have so much faith in the brains of the public that we take care to see they are not exercised. Some of the most valuable features of the classification are lost, and we do not think the reasons sufficient.

76. We have never held the Dewey to be an ideal classification from all points of view, but it undoubtedly is the most complete within its limits. It cannot compare for a moment with the Seventh Expansion of Cutter ; but, then, it is infinitely more simple. Moreover, it was a pioneer work, and " in these pursuits the first speculators lie under great disadvantages, and, even when they fail, are entitled to praise. Their pupils, with far inferior intellectual powers, speedily surpass them in actual attainments."¹ In a day when the scheme is too often criticised unjustly it is well to remember this ; to remember that Dewey is responsible for the excellent order prevailing in many libraries to-day. And we should here return to the ideas laid down in our

¹ Macaulay, *Essay on Milton*.

opening remarks as to the difficulty of obtaining a permanent statement of philosophical ideas. There is much force in Dewey's own contention, that it is wholly impracticable to have a library classification represent the best philosophical statement of the interrelations of human knowledge, as every year would require modifications and changes involving confusion and expense, and that the whole function of a system is that of a sort of intellectual system of pigeon-holes conveniently arranged and numbered, so that the librarian can always put a book or pamphlet on the same subject into the same pigeon-hole.¹ We do not wholly accept this position, as we have already shown that utility and theory are not always incompatible, but it brings us back to the truth that utility is the end of classification.

77. Before concluding this essay, we should like to revert to another idea of classification mentioned in our opening remarks. Classification is more than a mere method of arranging books ; it is a mapping out of knowledge. Why should not librarians be so conversant with such maps that they are able to prevent the intellectual worker from working in already tilled fields, and are able to show what fields remain unworked ? Perhaps we are a little inadequate to the task, but it is an ideal worthy of our effort. In England the study of classification has been retarded by unnecessary parsimony. We can-

¹ *Library Journal* (Atlanta Conference, p. 154), vol. xxiv, 1899.

not expect older librarians to study and develop classification ; but many of the younger ones have the desire to pursue the study. Works on the subject are expensive, however, and as the average older librarian, who to no small extent controls the treasury, will not buy them, the younger men study under the greatest difficulties. It is a melancholy fact that only a little more than one-third of British libraries are classified in the twentieth century ; but in this as everything " the whirligig of time will bring in his revenges."

V. *A Brief Select Bibliography*

78. The literature of the Decimal System is so large that a complete bibliography, if it were possible, would occupy a fairly large volume. It would be of little use, however, as much of it is mere repetition, and still more revolves round the interesting but comparatively insignificant question of notation. The following is a list of reasonably accessible matter, giving all that seems to be essential to a complete study of the system. The writer has refrained from introducing literature he has not read or examined carefully.

THE TABLES OF THE SYSTEM

DEWEY, MELVIL. *Decimal Classification and Relative Index for Libraries, Clippings, Notes, etc.* Ed. 8, 1913. Grafton. 30s. n.

Contains an elaborate introduction, in phonetic

English, detailing the history and application of the scheme, three summary tables, the main tables, the relative index and an index supplement, and index tables for geographical, form, language and philological divisions.

DEWEY, MELVIL. *Abridged Decimal Classification and Relative Index for Libraries, Clippings, Notes, etc.* 1894.

The tables are divided generally into three-figure places, with occasionally a fourth and fifth figure. The use of this without reference to the full edition is difficult and rarely satisfactory.

CRITICISMS AND REVIEWS

BROWN, J. D. *Library Classification and Cataloguing*, pp. 54-61. 1898. Grafton. 7s. 6d. n.

Outline and an elementary explanation.

— *Manual of Library Economy*, pp. 258-60, 1903; pp. 190-92, 1907. (New edition, 1915.) London: Grafton.

Outline.

DIESERUD, JUUL. "Suggestions Towards an Improved Decimal Classification." *The Library Journal*, vol. xxiii, pp. 607-09, 1898.

A paper by the librarian of Field Columbian Museum, Chicago, contending that Dewey is obsolete and suggesting a rearrangement "to meet the requirements of logic and science." This is the outline: 000-100 General Works and Literary Languages; 100-200 Philosophy and Abstract Concrete Sciences; 200-300 Astronomy, Geography and Geology; 400-500 Zoology; 500-600 Anthropology; 600-700 Anthro-Technology; 700-800 Industrial and Fine Arts; 800-900 Literature;

900-1000 History. Obviously not suitable for a general library, but interesting as possible for a general science collection.

DEWEY, MELVIL, and BISCOE, W. S. "Comments on Dieserud's Suggested Classification." *The Library Journal*, vol. xxiii, pp. 609-11, 1898.

Criticises the suggestion as "a scientist's idea of a science classification," and so preponderatingly scientific as to be useless for general libraries.

LYSTER, T. W. "Some Observations on the Dewey Notation and Classification, as Applied to the Arrangement of Books on Library Shelves." *The Library*, vol. viii, pp. 482-90, 1896.

—"Notes on Shelf-Classification by the Dewey system." *The Library*, vol. ix, pp. 329-39, 1897.

The results of the writer's experiences of the working of the system in a large library, with many ingenious suggestions on the problems of classification.

JAST, L. STANLEY. "Classification in Public Libraries with Special Reference to the Dewey Decimal System." *The Library*, vol. vii, pp. 169-78, 1895.

—"The Dewey Classification in the Reference Library, and in an Open Lending Library." *The Library*, vol. viii, pp. 335-50, 1896.

—"The Dewey Classification, and Some Recent Criticism." *The Library*, vol. ix, pp. 340-45, 1897.

—"Classification in British Public Libraries." *The Library Association Record*, vol. v, 1903.

Mr. Jast was one of the pioneers of the decimal system in this country. Although his papers are comprehensive, he deals largely with notation in

the first paper, but in the later ones he meets the critic on the grounds of theory. The third paper replies to criticisms in Mr. Lyster's *Some Observations*. The last sums up the advance of a decade. Taken together these papers form an admirable introduction to the system.

RICHARDSON, E. C. *Classification*, pp. 193-200. 1901; 1912. New York: Scribners. London: Grafton. 6s. 3d. n.

A brief bibliography, an outline, and a brief but admirable commentary on the system, and a few random examples of the notation.

ADAPTATIONS AND EXPANSIONS

INSTITUT INTERNATIONAL DE BIBLIOGRAPHIE DE BRUXELLES. *Manuel du Répertoire Bibliographique Universel*. Brussels.

The first fascicule is the "Exposé et règles de la Classification décimale," and is the best introduction to the expanded Dewey. This is followed by elaborately extended tables, an index alphabétique général occupying 350 pp., and a fascicule on "L'Organisation, travaux, méthode de l'Institut international de Bibliographie." The work consists of 2259 pp. An abridged edition, *Manuel Abrégé du Répertoire Bibliographique Universel: Organisation, Travaux, Méthodes, Tables Abrégées de Classification* (250 pp.) was published in 1905.

HOPWOOD, HENRY V. "Dewey Expanded." *The Library Association Record*, vol. ix, pp. 307-22, 1907.

The best introduction in English to the notation; a brief explanation of the marks and their correspondence with Dewey form marks rather than a description of the expansion as a classification.

HOYLE, W. E., and NÖRDLINGER, CLARA. "The Concilium Bibliographicum at Zurich and its Work." *The Library Association Record*, vol. i, pp. 709-18, 1899.

Describes the card catalogue of zoology issued according to a greatly extended Dewey scheme.

PARIS. MUSÉE DES PHOTOGRAPHIES DOCUMENTAIRES. VALLOT, J. *Classification Iconographique Générale. Pt. 2, Application de la Classification Décimale*, 1896. Au Siège de l'Association, Cercle de la Libraire.

SION COLLEGE LIBRARY, LONDON. *Order of the Classification*. Ed. 2, 1889. Clay.

A very free adaptation in which the initial decimal numbers have been superseded by letters, History placed between Theology and Philosophy in the order, Philology, Literature and Bibliography, and Literary History co-ordinated at the end. The remaining classes are as in Dewey. Some features are borrowed from Brunet.

WASHINGTON. UNIVERSITY LIBRARY. SMITH, CHARLES W. "An Expansion of the Dewey Decimal Classification for the History of the Pacific North-West." *Washington Historical Quarterly*, vol. ii, pp. 146-60, 1908.

APPLICATIONS

AMERICAN LIBRARY ASSOCIATION. DEWEY, MELVIL (Ed.). *A.L.A. Catalogue: 8000 vols. for a Popular Library, with Notes*, 1904-11. Grafton. 7s. 6d. net.

Pt. 1, Classified; pt. 2, Dictionary. Pt. 1 is in strict classified order, with annotations (generally feeble). The prefatory matter includes a brief

explanation of the system, and three summaries, i.e. of the 10 main classes, the first 100 divisions, and the first 1000 divisions.

NEWCASTLE-UPON-TYNE. CENTRAL PUBLIC LIBRARY.
Catalogue of Books on the Fine Arts, 1900.

May be regarded as typical of a series of un-annotated class lists issued by the Newcastle Libraries, in which a strictly classified section is preceded by an author list and summary of the class, and is completed by a subject index. In the latter class lists, which are upon Mathematics, Useful Arts, Education, etc., the Brussels geographical bracket is utilised.

PITTSBURG, U.S. CARNEGIE LIBRARY. *Classified Catalogue, 1907.* 5 vols.

Perhaps the most elaborately annotated complete catalogue in existence. Combines Dewey numbers and Cutter author marks in the notation.

APPLICATIONS : THE BRUSSELS EXPANSION

LIBRARY ASSOCIATION. HOPWOOD, H. V. (Ed.). *Class List of Best Books and Annual of Bibliography, 1907-8.* Grafton. 1s. 6d. net.

The Brussels relation marks are used throughout.

CHART OF THE OUTLINE OF THE LIBRARY OF CONGRESS CLASSIFICATION

A GENERAL WORKS. POLYGRAPHY.

- AC Collections. Series. Collected works.
- AE Encyclopædias.
- AG General reference works (other than cyclo-pædias).
- AI Indexes.
- AM Museums.
- AN Newspapers.
- AP Periodicals.
- AS Societies. Academies.
- AY Year-books. Almanacs.
- AZ Directories (general and obsolete special).
General history of knowledge and learning.

B PHILOSOPHY. RELIGION.

- B-J Philosophy.
- B Collections. History. Systems.
- BC Logic.
- BD Metaphysics.
Introductions to philosophy. Treatises.
Epistemology. Theory of knowledge.
Ontology.
Cosmology. Teleology.
Philosophy of religion.
- BF Psychology.
- BH Esthetics.
- BJ Ethics.
- BL-BY Religion. Theology.
- BL Religions. Mythology. Cults.
- BM Theology. Generalities.
- BN Historical (Church history).
- BQ Exegetical (Bible, etc.).
- BS Systematic (Dogmatics. Apologetics).
- BY Practical (Pastoral. Homiletics. Liturgics).

C HISTORY—AUXILIARY SCIENCES.

- CA Philosophy of history.
- CB History of civilisation (general and general special only).
- CC Antiquities. General.
- CD Archives. Diplomatics.
- CE Chronology.
- CJ Numismatics.
- CN Epigraphy. Inscriptions.
- CR Heraldry.
- CS Genealogy.
- CT Biography.

D HISTORY AND TOPOGRAPHY (*except America*).

- D General history.
- DA British history.
20-690 England.
700-749 Wales.
750-890 Scotland.
900-995 Ireland.
- DB Austria-Hungary.
- DC France.
- DD Germany.
- DE Classical antiquity.
- DF Greece.
- DG Italy.
- DH-DJ Netherlands.
1-399 Belgium and Holland.
- DH 901-921 Belgium.
- DH 901-916 Luxemburg.
- DJ Holland.
- DK Russia.
100-400 Russia. General.
401-438 Poland.
451-470 Finland.
751-999 Russia in Asia.
- DL Scandinavia.
1-81 Scandinavia. General.
101-296 Denmark.
301-398 Iceland.
401-595 Norway.
601-996 Sweden.
- DP Spain and Portugal.
1-462 Spain.
500-902 Portugal.
- DQ Switzerland.
- DR Turkey and the Balkan States.
- DS Asia.
- DT Africa.
- DU Australia and Oceania.

E-F AMERICA.

- E America (general) and United States (general).
- F United States (local) and America outside of U.S.

G GEOGRAPHY. ANTHROPOLOGY.

- G Geography. Voyages. Travel (general).
- GA Mathematical and astronomical geography.
- GB Physical geography.
- GC Oceanology and oceanography.
- GD Biogeography.
- GF Anthropogeography.
- GN Anthropology. Somatology. Ethnology. Ethnography (general). Prehistoric archaeology.
- GR Folk-lore.
- GT Culture and civilisation. Manners and customs.
- GV Sports and amusements. Games.

H SOCIAL SCIENCES. General.

- HA Statistics.
- HB Economics. Theory.
- HC Economic history. National production, economic situation (by countries).
- HD Economic history. Organisation and situation of agriculture and industries.
Land. Agriculture.
Corporations.
Labour.
Industries.
- HE Transportation and communication.
- HF Commerce, including tariff.
- HG Finance.
Money.
Banking.
Insurance.
Public finance.
- HJ Sociology. General and theoretical.
- HM Social history. Social reform.
- HN Social groups.
Family, marriage, women.
Associations, secret societies, clubs, etc.
Communities. Urban. Rural.
Classes. Aristocracy, third estate, bourgeoisie, peasantry, labouring classes, proletariat, serfs.
Nations. Races.
- HV Social pathology. Philanthropy. Charities and corrections.
- HX Socialism. Communism. Anarchism.

H SOCIAL SCIENCES General—*continued*.

- J Political science. Documents.
1-9 Official gazettes.
10-99 United States.
100-999 Other countries.
General works.
Theory of state.
Constitutional history and administration. General.
United States.
Other American states.
Europe.
Asia, Africa, Australia and Pacific Islands.
Local Government.
Colonies and colonisation. Emigration and immigration.
International law.
- JX Law.
- K Education. General works.
History of education.
Theory and practice. Educational psychology. Teaching.
Special forms, relations and applications.
Universities and colleges.
Other American.
Europe.
Asia, Africa, Oceania.
University, college and school magazines, etc.
College fraternities and their publications.
Text-books (general only; special text-books go with their subjects, B-Z.)
- LJ
- LT

M MUSIC.

- ML Musical literature.
- MT Theory.

N FINE ARTS. General.

- NA Architecture.
- NB Sculpture and related arts.
- NC Graphic arts in general. Drawing and design.
- ND Painting.
- NE Engraving.
- NF Photography (in art). See TR.
- NK Art applied to industry. Decoration and ornament.

P LANGUAGE AND LITERATURE.

- PA Philology and Linguistic.
Classical philology.
1-199 General.
201-891 Greek languages.
1001-1151 Mediæval and modern.
2001-2899 Latin language.
- PB Modern European languages.
Celtic language.
- PC Romance languages.
Teutonic languages.
- PD General.
Gothic.
Scandinavian.
- PE English.
- PF Frisian.
Dutch.
German.
- PG Slavic languages.
Lithuanian.
Lettish.
- PH Finnish.
Hungarian.
Albanian.
Basque.
- PS Oriental languages. General.
Hamitic.
Semitic.
Indo-Iranian.
Armenian.
Caucasian.
- PL Languages of Eastern Asia, C.
- PM Hyperborean languages.
American languages.

PN-PV LITERARY HISTORY. LITERATURE.

- PZ Fiction.

Q SCIENCE. General.

- QA Mathematics.
801-999 Analytic mechanics.
- QB Astronomy.
281-349 Geodesy.
- QC Physics.
81-119 Weights and measures.
801-999 Terrestrial magnetism and electricity.

CHART OF THE OUTLINE OF THE LIBRARY OF CONGRESS CLASSIFICATION

GEOGRAPHY. ANTHROPOLOGY.

Geography. Voyages. Travel (general).
Mathematical and astronomical geography.
Physical geography.
Oceanology and oceanography.
Biogeography.
Anthropogeography.
Anthropology. Somatology. Ethnology. Ethnography (general). Prehistoric archaeology.
Folk-lore.
Culture and civilisation. Manners and customs.
Sports and amusements. Games.

SOCIAL SCIENCES. General.

Statistics.
Economics. Theory.
Economic history. National production, economic situation (by countries).
Economic history. Organisation and situation of agriculture and industries.
Land. Agriculture.
Corporations.
Labour.
Industries.
Transportation and communication.
Commerce, including tariff.
Finance.
Money.
Banking.
Insurance.
Public finance.
Sociology. General and theoretical.
Social history. Social reform.
Social groups.
Family, marriage, women.
Associations, secret societies, clubs, etc.
Communities. Urban. Rural.
Classes. Aristocracy, third estate, bourgeoisie, peasantry, labouring classes, proletariat, serfs.
Nations. Races.
Social pathology. Philanthropy. Charities and corrections.
Socialism. Communism. Anarchism.

H SOCIAL SCIENCES General—continued.

J Political science. Documents.
1-9 Official gazettes.
10-99 United States.
100-999 Other countries.
JA General works.
JC Theory of state.
JF Constitutional history and administration. General.
JK United States.
JL Other American states.
JN Europe.
JQ Asia, Africa, Australia and Pacific Islands.
JS Local Government.
JY Colonies and colonisation. Emigration and immigration.
JX International law.
K Law.
L Education. General works.
LA History of education.
LB Theory and practice. Educational psychology. Teaching.
LC Special forms, relations and applications.
LD Universities and colleges.
LE Other American.
LF Europe.
LG Asia, Africa, Oceania.
LH University, college and school magazines, etc.
LJ College fraternities and their publications.
LT Text-books (general only; special text-books go with their subjects, B-Z.)

M MUSIC.

ML Musical literature.
MT Theory.

N FINE ARTS. General.

NA Architecture.
NB Sculpture and related arts.
NC Graphic arts in general. Drawing and design.
ND Painting.
NE Engraving.
NF Photography (in art). See TR.
NK Art applied to industry. Decoration and ornament.

P LANGUAGE AND LITERATURE.

Philology and Linguistics.
PA Classical philology.
1-199 General.
201-891 Greek languages.
1001-1151 Mediæval and modern.
2001-2899 Latin language.
PB Modern European languages. General works.
Celtic language.
PC Romance languages.
Teutonic languages.
PD General.
Gothic.
Scandinavian.
PE English.
PF Frisian.
Dutch.
German.
PG Slavic languages.
Lithuanian.
Lettish.
PH Finnish.
Hungarian.
Albanian.
Basque.
PS Oriental languages. General works.
Hamitic.
Semitic.
PK Indo-Iranian.
Armenian.
Caucasian.
PL Languages of Eastern Asia, Oceania, Africa.
PM Hyperborean languages.
American languages.

PN-PV LITERARY HISTORY. LITERATURE.

PZ Fiction.

Q SCIENCE. General.

QA Mathematics.
801-999 Analytic mechanics.
QB Astronomy.
281-349 Geodesy.
QC Physics.
81-119 Weights and measures.
801-999 Terrestrial magnetism and meteorology.

Q SCIENCE. General—continued.

QD Chemistry.
901-999 Crystallography.
QE Geology.
cf. GB, GC.
351-499 Mineralogy and petrology.
701-999 Paleontology.
QH Natural history.
201-299 Microscopy.
301-999 General Biology.
QK Botany.
QL Zoology.
801-999 General anatomy and embryology.
QM Human anatomy.
QP Physiology.
QR Bacteriology.

R MEDICINE. General.

RA State medicine. Documents. Public health.
Medical climatology. Hospitals.
Jurisprudence.
RB Pathology.
RC Practice of medicine.
RD Surgery.
RE Ophthalmology.
RF Otology. Phenology. Laryngology.
RG Gynecology and obstetrics.
RJ Pediatrics.
RK Dentistry.
RL Dermatology.
RM Therapeutics.
RS Pharmacy and materia medica.
RT Nursing.
RY Botanic, Thomsonian and eclectic medicine.
RX Homeopathy.
RZ Miscellaneous schools and arts.

S AGRICULTURE, PLANT AND ANIMAL INDUSTRY.

General agriculture, soils, fertilizers, farm implements, etc.
SB General plant culture, including field crops.
Horticulture. Landscape gardening and parks. Pests and diseases.
SD Forestry.
SF Animal husbandry. Veterinary medicine.
SH Fish culture and fisheries. Angling.
SK Hunting. Game protection.

T TECHNOLOGY. General.

TA-TH *Building and Engineering Group.*
TA Engineering. General. Civil engineering.
TC Hydraulic engineering (harbours, rivers, canals).
TD Sanitary and municipal engineering.
TE Roads and pavements.
TF Railroads.
TG Bridges and roofs.
TH Building construction.
9111-9600 fire prevention, fire extinction.
TJ-TL *Mechanical Group.*
TJ Mechanical engineering.
TK Electric engineering and industries.
TL Motor vehicles. Cycles. Aeronautics.
TN-TR *Chemical Group.*
TN Mineral industries.
TP Chemical technology.
TR Photography.
TS-TX *Composite Group.*
TS Manufactures.
TT Trades.
TX Domestic science.

U MILITARY SCIENCE. General.

UA Armies. Organisation and distribution.
UB Administration.
UC Maintenance and transportation.
UD Infantry.
UE Cavalry.
UF Artillery.
UG Military engineering.
UH Minor services.

V NAVAL SCIENCE. General.

VA Navies. Organisation and distribution.
VB Administration.
VC Maintenance.
VD Seamen.
VE Marines.
VF Ordnance.
VG Minor services.
VK Navigation.
VM Shipbuilding and marine engineering.

Z BIBLIOGRAPHY AND LIBRARY SCIENCE.

CHAPTER VI

THE LIBRARY OF CONGRESS CLASSIFICATION

I. *The Library and its Classifications*

79. FOR ninety-seven years after its foundation in 1800, the Library of Congress was housed in the Capitol at Washington; and at the end of this period, as may be readily supposed, its collections exceeded by far the space there available. It came into its new and magnificent home in 1897, a separate building of ample and handsome proportions having the orthodox huge-domed reading-room something resembling that of Panizzi at the British Museum, and ample space for marshalling the various divisions and correlating their contents, which consisted of about one and a half million volumes and pieces, with annual accessions approximating to over one hundred thousand. The first four years in the new building were years of organising work of the first order. They saw, to quote the *deus ex machina*, Dr. Herbert Putnam, "the collections, formerly indiscriminate, divided into certain main groups and in large part arranged and digested; most of these groups conveniently located; and the physical equipment and personal service appro-

priate to each determined, and in part provided. They have seen determined also, and initiated into each group, a system of classification which not merely recognises present contents but provides elastically for future development ; and catalogues which, also elastic, when brought to date will exhibit adequately the collections as they stand and be capable of expansion without revision.”¹ They saw, too, the establishment of the Library of Congress printed catalogue card, a standard card which could be obtained by all other libraries, and which made the Library the greatest bureau for the distribution of catalogue entries in the world ; and, by combination of architecture, cataloguing, classification and an ingenious and effective book-carrier system, the most rapid book service in any national or other large library came into being at Washington. We are concerned with only one factor in this remarkable result, the book classification which came into existence during these four years.

80. The history of the classification of any great library which has existed more than a century is a suggestive study. In some such libraries the accretions have overwhelmed classification altogether, as was the case with the Bibliothèque Nationale, where the librarians were swept beyond classification by the torrent of books which rushed into the library from other, and confiscated, collections during the

¹ Report of the Librarian of Congress for the Fiscal Year Ending June 30, 1901, p. 5.

Revolution ; but, where the classification has been continuous, the story is instructive as showing the difficulties caused by the early adoption of faulty or inadequate methods, and as showing the development of practice from the merely tentative and experimental to the more scientific method. Mr. H. Rutherford Purnell in his pamphlet, *The Development of Notation in Classification*,¹ has shown that the Bodleian Library presents a fair epitome of the various methods in vogue from mediæval to mid-Victorian times, and for the period of its existence the Library of Congress serves similarly. The earliest classification as exhibited in the earliest catalogue put forth by the first Librarian, John Beckley, in April, 1802, was *by size*, as might have been expected from a librarian who held also the office of Clerk to the House of Representatives. At that date the United States, as a nation, possessed in all only 964 volumes and 9 maps ; and the order of the catalogue ran : folios, quartos, octavos, duodecimos, maps. This system remained in vogue until 1812, by which year the Library has increased to 3,076 volumes and 53 maps, charts and plans. In this year the second Librarian, Patrick Macgruder, ventured on a catalogue, the fourth issued, of much more ambitious design, in which the works were classified under eighteen headings and sub-arranged in each by size. The classification, a somewhat

¹ Library Assistants' Association Series, No. 3 (out of print).

inchoate affair which reflects a few well-known scholastic systems, was as follows :

1. Sacred history.
2. Ecclesiastical history.
3. Civil history, biography, and antiquities.
4. Geography, topography, voyages, and travels.
5. Law.
6. Ethics, theology, and mythology.
7. Logic, rhetoric, and criticism.
8. Dictionaries, grammars, and education.
9. Politics, political economy.
10. Trade, commerce.
11. Military and naval tactics.
12. Agriculture and rural economy.
13. Natural history and philosophy.
14. Medicine, surgery, and chemistry.
15. Poetry, drama, fiction, and art.
16. Arts, sciences, and miscellaneous literature.
17. Gazettes.
18. Maps, charts, plans.

81. On August 24, 1814, occurred one of those war tragedies which occasionally scar the history of libraries. That day the British soldiery under General Robert Ross—who appears to have been unaware of the existence of the Library—burned the Capitol, and the greater part of the Library with it. At this juncture ex-President Thomas Jefferson offered Congress his private library of nearly 7,000 volumes, a collection which was, according to a later Librarian, Mr. A. R. Spofford, “an admirable selection of the best ancient and modern literature up to the beginning of the present [nineteenth] century.” After a Congressional wrangle

in which little of the modern American library spirit, but much of the average step-motherly English attitude to books, was shown, the library was acquired. This collection was catalogued and classified by Jefferson himself, and his *Catalogue of the Library of the United States*, published in 1815, was based upon a modification of Lord Bacon's divisions of knowledge ; forty-four divisions were employed and the arrangement of the titles under each was alphabetical. The following is the outline employed :

- 1-4. History—
 - Civil. Ancient and modern.
5. Ecclesiastical.
- 6-14. Natural. Philosophy, agriculture, chemistry, surgery, medicine, anatomy, zoology, botany, mineralogy.
15. Technical Arts. Trades, industries, education, games, reading.
- 16-1. Moral philosophy.
- 16-2. Law of nature and nations.
17. Religion.
- 18-23. Law. Equity, common, merchant, maritime, ecclesiastical, and foreign law.
24. Politics, commerce.
- 25-26. Arithmetic, geometry.
27. Mechanics, statics, dynamics, phonics, optics.
28. Astronomy.
29. Geography.
30. Architecture.
31. Gardening, painting, and sculpture.
32. Music.
- 33-39. Poetry, drama, romance, letters.
40. Logic, rhetoric, orations.
- 41-42. Criticism, bibliography.
43. Languages.
44. Polygraphical.

82. It is interesting to know that the Baconian classification, which has been the parent of so many bibliographical schemes and is the basis of the most popular of them all,¹ was maintained in the form given in both the books and catalogues of the Library until 1864. Indeed, with further modifications, it was in use until the end of the nineteenth century. The modifications were made by the Librarians, John Silva Meehan, in 1861, and A. R. Spofford at a later period, but their contributions were revisions of detail, involving indeed the transposition of certain classes and the expansion or curtailment of others, and the addition of form classes, geographical subdivisions, and alphabetical subdivisions; but essentially the classification of the Library of Congress for the first century of its existence was that of Lord Bacon.

83. When, with the beginning of the twentieth century, the Library of Congress had reached its high position, in number of volumes as in character, amongst the national libraries of the world, the Librarian determined upon the formidable task of providing his great collections with an entirely new minute classification. Older libraries have made efforts and experiments, but no national library of long history has yet accomplished the gigantic task of classifying its books according to any modern system of knowledge, or to any plan that the science of to-day would accept. The task is incredibly

¹ See section 68.

great, and could only be accomplished by such fine organisation as that of the Library of Congress, where there is a large force of workers who are primarily cataloguers and classifiers, and who have been chosen by the Librarian because of their technical qualifications; and where there are adequate, if not excessive, financial appropriations for the work. Even in these happy circumstances, the nearly twenty years since the scheme was initiated have not yet brought it to a conclusion. Much, however, has been accomplished, and although in the following pages we are dealing, as was the case with *The Expansive Classification*, with an incomplete classification, the outline is before us, and the detailed schedules of the system are sufficiently advanced to warrant a description and a review of the whole.

II. *A Brief Description of the System*

84. At the initiating of the Library of Congress classification there were in existence *The Decimal Classification* of Melvil Dewey, which long use in not inconsiderable libraries had approved, and the first six expansions of *The Expansive Classification* of Charles A. Cutter, while the seventh and final expansion of the latter was in progress. Both were detailed, flexible and equipped with unsurpassable notations, and if theoretical objections could be offered to the order of the first, the only obvious objection to the second was its unfinished state.

It would have seemed advisable that the Library of Congress should adapt one of these for its reclassification ; but obviously the circumstances of the Library were thought to require special treatment ; and an independent scheme was determined upon, the design of which was to be governed by the actual content of the Library. This last statement is important ; " Classification," says one writer on the scheme, " has preceded notation," a statement which implies the dubious notion that other systems, such as Cutter, have been made to fit a predetermined notation. Moreover, it implies—and the contention has been upheld by other writers—that the classification has proceeded book by book, the classifier constructing his schedule as he proceeded, without reference to any prearranged plan. Apart from the impossibility of mapping out a territory before one has a fairly comprehensive view of it, the contention, which we cannot find to have been made by any member of the Library of Congress Staff, is sufficiently disposed of by the fact that while the full tables of the Classification are as yet incomplete, an outline of the whole of the main classes and divisions was published in 1904. The general method of procedure is explained in the prefatory note to the schedules on Fine Arts, where we learn that " the schemes were produced originally in the Classification Section in the intervals of other work, and have subsequently developed to their present form by the actual classification of the collection of

books." That is to say, the Library of Congress Classification is based in outline upon other systems designed for the classification of knowledge and of books, and that this scheme has been adjusted and amplified during its application. This is borne out by Dr. Putnam's own words:¹ "The system of classification thus far applied is one devised from a comparison of existing schemes (including the 'decimal' and the 'expansive'), and a consideration of the particular conditions of this Library, the character of its present and probable collections, and of its probable use. It is assumed that the departments of history, political and social science, and certain others will be unusually large. It is assumed that investigators will be more freely admitted to the shelves."

85. *The Decimal Classification* seems to have furnished only suggestions for subdivision. The outline of the classification is almost directly based upon *The Expansive* system, as a comparative paradigm of the two will demonstrate :

EXPANSIVE

- A General Works.
- B Philosophy.
- Br Religion.
- C Christianity.
- D Historical Sciences.
- E Biography.

¹ "Manual: Constitution, Organisation, Methods, etc.," in *Report of Librarian of Congress for the Fiscal Year ending June 30, 1901*, pp. 223-24.

- F History.
- G Geography and Travels.
- H Social Sciences.
- I Demotics. Sociology.
- J Civics.
- K Legislation.
- L Sciences and Arts.
- M Natural History.
- N Botany.
- O Zoology.
- R Useful Arts. Technology.
- S Constructive Arts.
- T Fabricative Arts.
- U Art of War.
- V Athletic and Recreative Arts.
- Vv Fine Arts. Music.
- W Fine Arts.
- X Arts of communication by Language.

LIBRARY OF CONGRESS

- A General Works. Polygraphy.
- B Philosophy.
- BL Religion.
- C History—auxiliary sciences.
- D History and Topography (excluding America).
- E America (general) and U.S. (general).
- F United States (local) and America outside of U.S.
- G Geography. Anthropology.
- H Social Sciences.
- HB Economics.
- HM Sociology.
- J Political Science.
- K Law.
- L Education.
- M Music.
- N Fine Arts.
- P Language and Literature. Literary History.

- Q Science.
- R Medicine.
- S Agriculture. Plant and animal industry.
- T Technology.
- U Military Science.
- V Naval Science.
- Z Bibliography and Library Science.

A perfunctory examination of these tables shows that the later scheme is a direct copy of the earlier one, with only such adjustments as might be made to differentiate the outlines. These adjustments, by whatever means occasioned, destroy the "ideal order" of the system; and the resultant outline is arbitrary rather than historical or evolutionary, or indeed in any way scientific. So much is granted by its designers: "The system devised," says Dr. Putnam, "has not sought to follow strictly the scientific order of subjects. It has sought rather convenient sequence of the various groups, considering them as groups of *books*, not as groups of mere subjects."¹ In the result we have virtually a number of separate, mutually exclusive special classifications, having no logical sequence or connexion except the accidental one of their alphabetical notation.

¹ This is a distinction without a difference. A group of books is simply a group of subjects made concrete. However composite the character of books, they are in general works upon subjects. A perfect arrangement of books is therefore a perfect arrangement of the material of knowledge (subjects) with only such practical adjustments (general and form classes, etc.) as the physical form of books demands.

86. The outline has been developed with great minuteness ; and the method of that development cannot be exhibited by mere description. A complete chart is therefore given of the main classes and principal subdivisions, to which the reader must refer in considering the special features of the system. (See chart facing page 127.) Classes A and B do not present any deviation from earlier schemes in their content ; C resembles the Historical Parilipomena of Brunet and is notable only as including numismatics on the just assumption that coins are historical documents rather than art-work, or material on the history of exchange ; D is an arbitrary schedule in which chronology is subordinated to geographical arrangement, and Classical Antiquity and all it implies instead of coming at the head of the schedule after General History is wedged in between Germany and Italy ; E and F are allocated to America, which subject, as is just, receives very full treatment in the complete tables ; class G, Geography and Anthropology, is one of the most curious in the system, and may be said to cover the world, its exploration, scientific measurement and plotting ; its inhabitants, their kind, distribution, folk-lore, culture, customs and amusements—this location of the recreative arts is curious and noteworthy ; classes H–L, the Social Sciences, differ only in order, and in the omission of the Art of War, Folk-Lore, and Manners and Customs, from the well-known content of the Decimal class 300 ;

classes M, Music, and N, Fine Arts, call for no comment, except that Landscape Gardening is omitted from the latter and appears at SB as a division of Agriculture ; P, Language and Literature, consists of two separate sequences, the arrangement in each being by the families of language, i.e. Celtic, Romance, Teutonic, Slavic, etc. ; class Q, Science, follows the arrangement of the Decimal class 500, but with the already-noted exclusion of Anthropology, and with the inclusion of Human Anatomy and Physiology ; classes R, Medicine, which contains the subjects of the Decimal class 610, and S, Agriculture, Plant and Animal Industry, which includes Landscape Gardening, Forestry, Angling, and Hunting, are ancillary to Science ; the great class T, Technology, is divided logically into four groups : the Engineering and Building, Mechanical, Chemical, and Composite respectively, and Photography, which must not be confused with NF, which is for collections of photographs, is considered as a unit in the Chemical group ; while the comprehensive classes U, Military Science, and V, Naval Science, which rightly includes Seamanship, Shipbuilding, and (more doubtfully) Marine Engineering, is auxiliary to Technology ; and the classification is rounded off by class Z, Bibliography and Library Science, an arbitrary but doubtless convenient arrangement of a class which theoretically is of general character, and might claim a place at the head of the system.

87. This brief conspectus intends no more than to exhibit the main features of the system ; its detailed working-out, in which some divisions bulk as largely as main classes, can only be seen by an examination of the completed tables.¹ The method of filling in the outline from the shelves, as classification proceeded, has not made for anything like a consistent system, and the description of the arrangement of any one class will only approximately exhibit that of any other ; but it is necessary that a few examples should be given in order that the reader may gain some idea of their method and magnitude. We may consider J, Political Science, one of the divisions of the main class Social Sciences. The division occupies 340 quarto pages, divided in the proportions of Synopsis, 19 pages, Main Schedules with intervening auxiliary tables, 264 pages, and Relative Index, 52 pages. The main schedules are printed in single column with an average of 40 terms to a page, from which it will be seen that for this one subject alone over ten thousand places are provided. The outline of the division is as follows :

- J Official Documents.
- JA General Works.
- JC Political Theory.
- JF Constitutional History and Administration. General Comparative.
- JK United States.

¹ A consideration of the paginations of each section as given in the Bibliography in section 102 will show the extent of the classes.

- JL British America. Latin America.
- JN Europe.
- JQ Africa, Asia, Australia, etc.
- JS Local Government.
- JU Colonies and Immigration.
- JV Emigration and Immigration.
- JX International Law.

This bare outline subdivides as regards a section, selected almost at random, as follows :

- JC Political Theory : Theory of the State.
 - 21-45 The Primitive state.
 - 47-50 The Oriental state.
 - 51-89 The Ancient state.
 - 101-126 The Mediæval state.
 - 131-299 The Modern state.
 - 301 Origin of the state.
 - 311-323 Nation and territory.
 - 325-347 Nature, entity, concept of the state.
 - 348-499 Forms of the state.
 - 501-628 Special relations of the state.
 - 541-561 The state and social groups.
 - 501-628 Special relations of the state, *continued*.
 - 571-628 The state and the individual.

And finally, the full tables for one of these subdivisions are as follows :

- JC 51 Ancient State. General Works.
 - 52 History of theory.
 - 55 Special Topics, A-Z.
 - e.g. Plebiscite.
 - 61 Assyro-Babylonian Empire (Code of Hammurabi).
 - 66 Egypt.
 - 71 Greece. Contemporary treatises.
 - Aristotle
 - .A4-6 Texts.
 - .A7A-Z Criticism, etc.

- 72 History. Early Works.
- 73 General. History of Institutions.
- 74 History of theory.
- 75 Special, by subject, A-Z.
e.g. Citizenship, Ephors, Federal
Government, Suffrage, etc., etc.
- 77 Political parties.
- 79 Local, A-Z.
- 81 Rome. Contemporary Treatises.
Cicero
.C4-6 Texts.
.C7A-Z Criticism, etc.
Plinius Cæcilius Secundus
.P4-6 Texts.
.P7A-Z Criticism, etc.
- 83 History. General. History of Institutions.
- 84 History of Theory.
- 85 Special by subjects, A-Z.
e.g. Citizenship. Democracy, Ju-
diciary, Magistracy. Provincial
administration. Senate.
- 88 Special by period. The Republic.
- 89 The Empire.

88. Within the classes the arrangement of the hierarchy is roughly historical. Matters capable of treatment as a chronological development receive this treatment ; and in other branches of knowledge the order is from theory to application ; for example, Hydraulic Engineering proceeds from the history of the subject, through the theoretical treatises on Hydrostatics, to preliminary engineering operations, and thence to harbour, river and canal works. This is, however, not carried to its logical conclusion as in the Subject Classification, where all sciences, arts, and industries are traced from their bases to

their application ; it is rather a fortuitous feature of the system.

89. This final table exhibits several important features of the scheme, in particular the free use of alphabetical topical and local sub-arrangements, as at 55, under which number works on special subjects of the theory of the ancient state are arranged alphabetically by the name of the subject, and at 79, where the local political parties of Ancient Greece are arranged similarly. The mention of these points reminds us that throughout the scheme the form and geographical divisions are repeated (*but not with a mnemonic notation as in Dewey*) under every topic which justifies their use. The result is a great enlargement of the tables as compared with any other systematic classification without any very obvious advantage. This may be illustrated from the Social Sciences, where it will be seen that the same or similar headings recur under each division :

HA Statistics.

1	Periodicals.
9-11	Congresses.
13-15	Collections.
16	Comprehensive Works.
17	Essays.
19	History.
23	Biography.
29	Theory.

HB Economic Theory.

1-9	Periodicals.
21-29	Congresses.
31-55	Collections.

- 61 Encyclopædias.
- 71 Method.
- 75-125 History.
- 151 etc. Theory.
- HD Economic History.
 - 21 General Works.
 - 31-37 General Treatises.
 - 41-61 Special Treatises.
 - 67 Exhibitions.
 - 82-91 Economic Policy.
 - 101 Periodicals.
 - 103 Associations.
 - 105 Congresses.
 - 109 Law and Legislation.
 - 111 General Works.
 - 113 etc. History.

A consideration of these three examples, which appear in similar manner throughout the classification, shows that no attempt at economy in marking, or in making uniform form divisions has been attempted. All of these might have been made uniform, and one notation might have been used which would have been applicable to *any* class heading, with great economy in the schedules, and a definite mnemonic value in the notation. Similar description and criticism apply to the geographical subdivisions of subjects which are used throughout very freely. It would be thought desirable in a scheme where geographical subdivision occurs in almost every schedule that a geographical list with a consistent order and a consistent notation (as Cutter's Local List, or Dewey's 930-999), capable of application as desired to each heading, would

have been devised as a preliminary. To a marked extent the Library of Congress system recognises the need for such a table, and tables for countries and states, to be used where alphabetical geographical division is indicated, form appendices to certain of the schedules (notably to Social Sciences), but these are auxiliary to the geographical subdivisions of topics, which are given in full in the schedules themselves. The following are examples :

H Social Sciences.

1-8 Periodicals.

- 1 American and English.
- 3 French.
- 5 German.
- 7 Italian.
- 8 Other.

H 10-19 Societies.

- 10 International.
- 11 American and English.
- 13 French.
- 15 German.
- 17 Italian.
- 19 Other.

H 21-29 Congresses and Exhibitions.

- 21 International.
- 22 American and English.
- 23 French.
- 25 German.
- 27 Italian.
- 29 Other.

Clearly these constant repetitions inflate the schedules enormously. We do not wish to give a wrong view of this subject, and we repeat that the need for

general tables is recognised, as we show below in section 93.

90. A subsidiary, but not unimportant, feature of the system is the arrangement of Biography. For Biography, collective or individual, which does not illustrate any particular subject, a general place is provided at CT, where it is regarded as an auxiliary of History, as is usual in other systems. Biography which illustrates any subject, however, is classified with the subject. In other systems this subject-division is usually permissive ; here it is the rule.

91. The notation of the Library of Congress Classification is of the "mixed" variety ; that is it deviates from the ideal notation, which is "pure" and uses one form of symbol only, in being a combination of letters and figures. Main classes are marked with a single capital letter, i.e.

- A General Works.
- B Philosophy.
- C History, etc.

and main divisions by an added capital letter, i.e.

- AC General Works : Collections, Series.
- AE Encyclopædias.
- AG General Reference Works.
- AI Indexes, etc.

And this is the limit of the use of letters in marking classes and divisions. It will be remarked, on reference to the chart, that the second capitals are added arbitrarily, gaps being left for possible intercalations

of new topics. The distribution of the letters in the main classes in no way shows the subordination of topics. Thus, in the following :

D	History and Topography (except America)
E	America.
F	United States.
G	Geography.
H	Social Sciences.
HB	Economics.
HM	Sociology.
J	Political Science.
K	Law.
L	Education.

there is nothing in the notation to suggest that E and F are really divisions of the main class D, or that J, K and L are subdivisions of H. In an ideal notation both of the divisions E and F would have an initial D, and all the divisions HB to L an initial H in their notations. The ideal of economy in numbering rather than of showing this subordination of topics has been followed.

92. Further subdivision is secured by the use of arabic numerals read arithmetically, beginning at 1 at each main division. A few examples will illustrate :

TA	Engineering
1	Periodicals and Societies. American and English.
2	French.
3	German.
4	Other.
5	Congresses.

- TC 353 Sea Locks.
 355 Docks.
 357 Piers, etc.
- TH 7561 Steam Heating of Buildings, General.
 7562 Pocket Books.
 7563 Specifications.
 7565 Theory.

and so on. Two letters and four figures are the common *limit* of the length of the notation, but the majority of the places in the schedules fall between one and three figures.

93. The notation does not end here, however, as we have already hinted. In almost every schedule special tables for the further subdivision of headings have been provided. The most obvious is the geographical table, which is appended to G, Geography; H, Social Sciences; T, Technology; and U-V, Military and Naval Sciences. We give a sample from its alphabetical form.

Abyssinia	A2
Afghanistan	A3
Algeria	A4
Argentine	
Republic	A7, etc.

These are used after a point for dividing subjects according to the direction in the schedules "local, A-Z" or "by countries, A-Z." The letters have not a constant meaning; thus, in three separate alphabeting tables A8 may mean Australia or Arkansas, A2 may mean Abyssinia or Alabama. Further

examples of the use of special, and arbitrary, alphabeting numbers are as follows :

TC 657.A3	Great Britain	Report of Royal Commission on canals.
TC 664.M2L4	Leech	History of Manchester Ship Canal.
TC 674.K2A4	Germany	Kanalamt. Kaiser Wilhelm-Kanal.

There are also, in J, Political Science, special tables for marking official documents, consisting of a letter and figure after a point, as .A2=Early series of legislative documents ; in B, Philosophy, a similar table for arranging the works of individual philosophers ; in E-F, America, several such tables for marking works on individual states and biographies ; in L, Education, for marking individual institutions ; in ML, Music, for individual composers ; in N, Fine Arts, a geographical series differing from those already mentioned in greater fullness, and with special emphasis on art countries and cities ; in Q, Science, for marking the chemical elements, the various botanical and zoological families, the compounds in pharmacology, and the subdivisions of bacilli, and in S, Agriculture, for animal and plant distribution. Besides these, there are subsidiary tables for differentiating aspects of various minor topics ; in fact, special tables for purposes of minute division are a very important part of the classification.

94. The indexing of the system leaves little to be desired. Each class, as far as published, is equipped with its separate index. This is of the relative variety, and when, as it is hoped will be the case, these indexes are cumulated finally, the result will be an instrument of great value. A sample of its method must be given :

Automobiles	TL 1-290
Alcohol	TL 217
Auto-trucks	TL 230
Automobile trains	TL 235
Biography	TL 139-40
Catalogues	TL 160, 200-29
Collections	TL 8
Compressed Air	TL 225
Congresses	TL 6
Design, construction	TL 9
Electric	TL 220
Endurance tests	TL 290
Essays, etc.	TL 155
Exhibitions	TL 7
Gasoline	TL 205-15
History	TL 15-124
Law	HE 5619-5720
Patents	TL 280
Periodicals	TL 1-4
Steam	TL 200
Tables,	TL 151
Pocket Books	
Tires	TL 270
Treatises	TL 144-5
Year Books	TL 5

It is scarcely possible to imagine an index carried to greater fullness.

III. *Criticism and Appreciation*

95. The theorist, with a determined set of canons for the guiding of his judgment, in considering the Library of Congress Classification is confronted at the outset by the declared intentions of its designers. These, we have already seen, were modest enough in statement ; far too modest for the colossal nature of the task undertaken. Theory requires that a classification shall be a microcosm of all knowledge as revealed in books, an atlas of the field of learning, in which all the territories of the various countries are clearly defined and their relations affirmed. Judged by this rule, the Library of Congress system is the most unsatisfactory of the four great bibliographical classifications to which this work is devoted. The main classes, as a whole, do not modulate into one another ; and there is, in these classes, no historical, evolutionary or involutory order. Theoretical considerations have not weighed with the compilers or fettered their activities, and the result, as we have seen, is not a complete subjective compendium of knowledge such as we have in the Expansive and Subject Classifications, but rather a series of large special classifications. This, indeed, was almost inherent in the method adopted. One mind designed the general outline, and supervised the working out of the schedules, but that working-out was accomplished by specialists in the various classes of the Library of Congress.

96. Without withdrawing any one of the requirements laid down in our Canons, we have to admit the very practical answer of the compilers, an answer not urged in words, but in the little less than glorious fact that this classification is no unimportant factor in the wonderfully rapid service of the Library of Congress, which is equalled by no other library of a similar size in the world. Any criticism of the scheme from the academic standpoint is corrected by its accomplishment. All we can do is to draw attention to a few general points as a preliminary to the final criticism of the scheme, which can only be made when it has survived a long period of use. The first fact is the great bulk of the scheme; already the printed schedules run to thousands of pages. These it is admitted are largely inflated by the constant repeating of form and geographical divisions, which could have been treated once and for all; but, even supposing their omission, the tables are very extensive. This must not be regarded as a fault, since it is the everyday experience of classifiers that the most minute tables yet produced are not sufficiently minute for every purpose to which bibliographical classification may be put. Some idea of the minuteness of this system may be gained from a consideration of the fact that thirty-one places are provided for editions of a single work of Thomas Paine, *The Rights of Man*, which form part of an extensive special table of Paine at JC 177. As it stands the system is

unlikely to be adopted in any library of less than national proportions.

97. The notation has received a fair share of criticism, and not altogether without reason. The direction of this we have already indicated in part. It does not answer altogether the criteria of brevity, simplicity and expansibility, nor does it, as has already been demonstrated, show the subordination of subjects with any precision. As a matter of fact the Library of Congress suffered by its late appearance. The best notation of all—the decimal—had already been appropriated; and the next best—the alphabetical—had become associated with *The Expansive* system. Instead of effecting a compromise between these two notations, in which the broad base of the alphabet would be used to mark main classes, and the infinitely elastic decimal number be used to mark divisions, a not very skilful alphabetical outline was preferred, with ordinary continuous arithmetical subdivisions, blanks being left both in the alphabet and in the numbers for future insertions. In the result the average length of symbol is shown as follows:

TC 353 Sea Locks. TK 2681 Direct Current Motors.

and when the metals in Chemistry are to be shown by number and alphabeting table, such symbols as these appear:

QD 181 B2 Barium. QD 181 C15 Cyanogen.

the first of which Dewey expresses by 546.43. It

will be seen that this notation, although not very complex, is much more so than any of the notations we have hitherto considered, and is in every way inferior.

98. We have already seen that its indexing is exceptionally full and is relative. In a cumulated version it would be desirable to insert the class headings after many of the entries to show the special view point from which they are regarded. With this addition the index will be one of the most perfect.

99. A feature of the system, and one which makes for great usefulness even to those who will never use the system as a working classification, is the excellence of the terms chosen for the headings, and the fullness with which they are set out. In some parts of the system, too, as for example, freely in the America schedules, definitions are given of the sense in which the headings are to be used. A practical classifier, who has felt the grave want of what may be called annotations of the terms in the Decimal and other classifications, can only express gratitude. These America definitions run to pages of letterpress in places.

100. We have already expressed our opinion that the system will rarely be adopted by libraries of less than national proportions. One gathers from the reports of the Library of Congress that it has some vogue in the United States, but how far it extends we are unable to discover. It would be

very natural to expect it to be used in part by American libraries, since the tables on America, for example, with the admirable definitions to which reference has been made, form in many ways the fullest, as in some ways they are the ideal, classification of the country. Again, the fact that the schedules on America as well as those on Music, Science, and Library Economy and Bibliography, have run out of print, shows that an extensive use has been made of them. In the United Kingdom the system is little known, and has been regarded by its very few critics as gargantuan and far too complex for general application. A new interest in it arose, however, when Mr. John Ballinger determined to adopt it for the new National Library of Wales. Within a few years it may be possible to see its practical value in a national library other than the one which gave it birth and for the special needs of which it was devised. So far it seems to be giving satisfactory results.¹

101. Whatever may be the future of the system in Great Britain, it is really a remarkable achievement. It is not the first time that an attempt has been made to apply minute systematic classification to a great library; the late E. A. Nicholson attempted it for additions at the Bodleian. It is the first time, however, that such a scheme has been

¹ So much was to be gathered from an important paper (not yet printed) which was read before the Library Assistants' Association in 1913 by Mr. Arthur J. Hawkes, of the National Library of Wales.

gradually built up and published as it advanced. To experiment, and to publish the results, is a daring and an invaluable work ; and, if the results fail in places to meet some critical tests the achievement is undoubted. The scheme has now been applied to about two million works, and every day is adding to it new parts and new usefulness. The completion of the tables is not far distant ; and with that may come a further study and understanding of the greatness of the work. Meanwhile some conception of its aim and its difficulties may be gained from the words of the Chief Classifier, Mr. Charles Martel, which in the nature of an apologia justify the experiment, but are sufficient to warn librarians with smaller resources from attempts at imitation.

“ It has been the endeavour from the beginning to incorporate in the classification scheme the results of the experience gained both in the first application of the schedules in reclassification and in later continued use in classifying new books. A certain ideal was kept in view, but it was a practical one. The ambition was to make the best of an unrivalled opportunity and to produce a classification in which the theory and history of the subjects as represented in a great collection of books should constitute the principal basis for the construction of the Scheme, compared and combined of course with their presentations as derived from other classifications and treatises. It was recognised beforehand and con-

firmed over and over again in the course of the undertaking that no amount of preliminary study, consultation and taking pains in the preparation of the provisional draft could produce other than a largely theoretical scheme, more or less inadequate and unsatisfactory until modified in application. A clearer and wider view of many a problem provisionally disposed of would often present itself as class after class was conscientiously worked over, discovering new aspects and relations of certain subjects or the same relations in a different light and making it desirable and sometimes necessary to revise an earlier and adopt a better solution. It may be admitted that with all the effort spent in improving the schemes in the light of further experience, an approach to the ideal in mind has been realised if at all only in a slight and imperfect degree. On the other hand that degree might have been advanced materially if printing could have been postponed until all the schedules were completed. Many omissions, imperfections and inconsistencies might have been eliminated if there had been more time. The responsibility for some of these may be laid in part at least upon the hindrances incidental to the conditions under which the work had to be carried out that the other service of the Library might not be unduly interfered with. Whether the principle adopted and the manner and extent of its application were in the line of progress remains perhaps for the future to demonstrate. That the

attempt has succeeded in some measure is indicated, I think, by several communications which have reached us from the outside with regard to the classification, in which that element is commended and recognised as more or less distinctive of the Library of Congress System."¹

A BRIEF SELECT BIBLIOGRAPHY

102. The system has been less written about than any other, and the following list exhausts most of the available literature. Applications of the system in cataloguing may be studied in the various lists and special bibliographies issued by the Library of Congress. These are not included in the list.

HISTORY OF PREVIOUS LIBRARY OF CONGRESS SYSTEMS

LIBRARY OF CONGRESS. "Manual: Constitution, Organization Methods, etc." In *Report of Librarian of Congress*, 1901. Illus. 1901.

An admirable account of all the activities of the Library, including an historical sketch, with excellent illustrations.

JOHNSTON, W. D. *History of the Library of Congress*. Vol. i. 1800-64. Illus. 4to. 536 pp. 1904. Washington: Library of Congress.

A handsome and extensive history which gives records of the adapting of the various classifications for the period covered, and, in the appendix, a table showing the schemes of 1812, 1815 and of Meehan and Spofford.

¹ *Report of the Librarian of Congress for the Fiscal Year ending June 30, 1911*, pp. 61-62.

THE TABLES, AND DESCRIPTIONS, OF THE PRESENT
SYSTEM

LIBRARY OF CONGRESS. *Classification*. 4to. 1901-.
Washington: Government Printing Office.

The schedules are appearing separately for each class or important division as they are completed. They vary in size. The following is a list of those published to the end of 1914.

Outline Scheme of Classes: Preliminary, December, 1909. 24 pp. 1910. 10 cents.

An earlier outline was published in 1904.

Class A. General Works. Polygraphy. 63 pp. 1911. 10 cents.

Class B.

B-Bj. Philosophy. 109 pp. 1910. 15 cents.

Class E-F. America. 1901. Ed. 2, 298 pp. 1913. 40 cents.

Class G. Geography, Anthropology, Sports and Games. 128 pp. 1910. 20 cents.

Class H. Social Sciences. 551 pp. 1910. 65 cents.

Class J. Political Science. 340 pp. 1910. 40 cents.

Class L. Education. 161 pp. 1911. 25 cents.

Class M. Music. 112 pp. 1904.

Class N. Fine Arts. 161 pp. 1909. 15 cents.

Class Q. Science. 196 pp. 1905. Ed. 2, 1913. 25 cents.

Class R. Medicine. 174 pp. 1910. 25 cents.

Class S. Agriculture: Plant and Animal Industry. 87 pp. 1911. 15 cents.

Class T. Technology. 303 pp. 1910. 35 cents.

Class U. Military Science. 93 pp. 1910. 15 cents.

Class V. Naval Science. 106 pp. 1910. 20 cents.

Class Z. Bibliography and Library Sciences.
III pp. 1902. Ed. 2, 1910. 15 cents.

LIBRARY OF CONGRESS. *Reports of the Librarian of Congress for the Fiscal Year ending 30 June, 1901, and annually since.*

Each issue contains a brief report from the Chief Classifier on the progress of the system, with notes on its methods, problems and practical working.

— "Account of the Catalogues, Classification and Distribution Work." *Library of Congress Bulletin*, vii, 28 pp. 1904.

OUTLINES, CRITICISMS, ETC.

BROWN, J. D. *Library Classification and Cataloguing*, pp. 78-79. 1912.

Outline of main classes, with brief descriptive criticism (unfavourable).

HICKS, F. C. "Library of Congress Classification and its Printed Catalogue Cards." *The Library Journal*, vol. xxxi, pp. 255-56. 1906.

RICHARDSON, E. C. *Classification: Theoretical and Practical*, pp. 136-40. 1912. Charles Scribner's Sons. London: Grafton. 6s. 3d. net.

Outline of main classes and divisions with brief description.

SMITHER, R. E. "The Library of Congress Classification." *The Library World*, vol. xvi, pp. 130-36, 1913-14.

A brief history, description and criticism.

UNITED STATES LIBRARY OF CONGRESS CLASSIFICATION
SCHEME. *The Library Association Record*, vol. vii,
pp. 663-64, 1906.

A brief review, by a well-known writer on
classification.

CHAPTER VII

ELEMENTS OF NOTATION

103. NOTATION and classification are not convertible terms ; they are entirely different questions. The function of a bibliographical classification is arrangement ; that of notation is merely to indicate that arrangement. In fine, the librarian who chooses a classification merely because it has a particular form of notation shows a lamentable regard for what is essential in a classification. Given that two classification schemes are of equal merit in every other respect, the final choice may be determined by the notation ; but the initial requirement of a scheme is that it shall assemble books, with sufficient minuteness, in the order most convenient to the users of the collection. All other questions, including that of notation, are entirely subsidiary. With this necessary disparagement of the subject, we may be allowed to gather together some of the current notions as to what constitutes the notation of any scheme.

104. The orthodox definition of a notation is that it is a shorthand sign to represent a word, and the

best known examples are the signs used to represent the chemical elements.

105. Notations are said to be *pure* when they are composed of symbols or letters of the same character : as of figures, or of letters of the alphabet, or of arbitrary signs, and of one of these kinds only. When composed of letters and figures, or any other symbols in combination they are said to be *mixed*. Examples come readily to mind. The Decimal and Expansive schemes have pure notations ; the Subject and Library of Congress schemes have mixed notations.

106. The criteria of orthodox notation are *simplicity*, *brevity* and *expansibility* in this ascending order of importance. We may develop these somewhat and indicate necessary principles as they arise.

107. That it is advantageous for a notation to be simple is an evident assumption. The more commonplace the symbols used, the nearer they are to signs in everyday use, the easier is it for the user to comprehend them. A specimen notation from the Expanded Decimal Classification of the Brussels Institute of Bibliography is :

91(44)(03)=2 Dictionary of French Geography in English.

a perfectly intelligible number to the initiated, but somewhat complex for the ordinary user of libraries of whatever class.

What, then, is a simple notation? Probably the simplest symbol in existence is a continuous sequence of Arabic numbers arranged ordinally—1, 2, 3, 4, etc., and next the sequence of the letters of the alphabet. Signs drawn from geometry, Greek letters, asterisks, etc., have no ideographic value, convey no image or idea to the mind; they may therefore be ruled out as complex. Such signs are used in what is in many ways a good bibliographical classification, that by Lloyd P. Smith (1882). It seems, then, that figures or letters are to be preferred, and it seems equally clear that a pure notation should be easier to follow than a mixed one. The advantage may be only apparent, because simplicity turns not only upon the *kind* of symbol employed; it is determined largely by its *length*. This leads us to consider the related question of brevity in notation. The *base* of the notation is the initial figure or letter used in marking the main classes. A continuously numbered scheme is said to have an arithmetical base, Dewey's is said to have a decimal and the Expansive scheme an alphabetical base. The length of a notation is determined by the extent of the base. Clearly, the continuous arithmetical number promises the briefest notation; the decimal number is limited to a base of ten; the alphabetical to a base of twenty-six symbols. As the base symbols indicate the main classes, it is now quite evident that the length of a notation is determined by the number of main classes in the scheme to which it is applied. The

Decimal Classification has ten main classes ; i.e. ten groups that can be represented by a single figure. If we were to reduce this number of classes to five, it would be seen that the five classes left over would necessarily be regarded as divisions of the first five. Hence, to note them, two figures would be required. Continuing the process it would be seen that the notation had doubled its length. Therefore, the more main classes a scheme has the briefer will be the notation, and, of course, the converse is true.

108. We can prove this best by enunciating another rule of classification notation : *the notation must show the sequence of the divisions*. That is to say, the main classes must each be marked by a separate and distinct symbol ; and the divisions of each of these classes must be marked by a number the first symbol of which is the number of the class. If we consider, for example, Bacon's Classification, we shall see that it has a large number of divisions and subdivisions, but has only three main classes :

History.
Poesy.
Science.

In giving a notation to the scheme, if we are perfect theoretically, we shall only use three basic symbols, say 1, 2, 3 ; and the divisions and subdivisions will be shown as in the sample we append :

1 History.
11 Natural History.
111 Generations.

1111	Astronomy.
1112	Physiography, etc.
112	Pretergenerations.
1121	Monsters.
113	Arts.
12	Civil History.
121	Ecclesiastical.
1211	Church.
1212	Prophecies, etc.
2	Poesy.
21	Narrative.
22	Dramatic, etc.

Thus the notation shows the relation of each subject to each preceding one. In this way a perfect notation of the Bacon Classification would necessarily be lengthy; and the principle of notation, here illustrated, lies at the back of all the orthodox notations. Seeing, however, that length is a real objection, the designers of schemes have usually divided knowledge into as many broad classes as possible, sacrificing sometimes the theoretical virtue of sequence for the more obviously practical convenience of brevity.

109. It may now be assumed that simplicity depends upon brevity, and brevity upon the extent of the base of a scheme. The question, therefore, of which kind of notation, if any, is best cannot be dismissed as summarily as our earlier remarks might imply. It may be said, however, that a notation which conveys a definite *idea* is to be preferred to one that does not. The figures 189 convey an idea of quantity, as to some extent does the combination

B495 ; but no such idea is conveyed by XGR, which can only be carried in the mind by a definite effort of memory.

110. Far more important than simplicity or brevity is the third requirement, flexibility—or expansibility, adjustability, relativity, as it is variously called. Unless a notation permits of the insertion of a new number at any point in the sequence without dislocating that sequence, it will not long be of practical value. The reason is the obvious one that new topics are constantly arising for which a place must be found ; and flexibility is essential both in classification and notation. In a rigid arithmetical notation, numbered from 1 to infinity, it is clear that any extensive flexibility is impossible. A certain hospitality for new topics can be made by leaving numbers vacant at frequent intervals ; but it will be found that topics do not occur in any regular proportion throughout the classification ; that the vacant numbers will rapidly be filled in all or in some parts of the classification ; and that consequently the notation breaks down. For these reasons rigid notations are never used in a good scheme. On the face of it the notation of the Subject Classification is a rigid one, in which numbers are left vacant for new topics ; but this is a limited use of the notation. The designer of the scheme definitely says that his entire numbers may be treated as decimals, and gives as an example the numbers :

K951 Catholic Apostolic Church.

K952 Christian Endeavour Society.

and shows how various new sects may be intercalated by a decimal treatment :

K951 Catholic Apostolic Church.

K9511 Christian Strugglers.

K9513 Christian Worshippers, etc.

The Decimal Classification permits the indefinite expansion of its notation by the same method of adding a figure to an existing number to make a new number. Thus, if the existing tables are

546.4 Alkaline earths.

546.41 Calcium.

546.42 Strontium.

546.43 Barium.

546.44 Magnesium group.

and it is desired to insert the recent metal Radium, it may be done by dividing the appropriate head, Barium, thus :

546.432 Radium.

The digit added is arbitrary ; 1, 5, 6, or any number would serve equally. The simple rule of intercalating numbers is : *When a new topic arises, find the nearest related head in the classification and make the new number there.* It is worth while uttering the obvious warning that new numbers should only be made for new subjects. Often words which are synonyms of terms already existing give rise to the desire to make new numbers, when there is, of course, no need of them.

III. A subsidiary, but very ingenious and sometimes useful feature of notation is what is called its *mnemonic value*. This means that in the notation a certain subject has always a certain symbol as part of its number. In the Decimal Classification, for example, the figure 2 always appears in the number for England in whatever aspect, 3 for Germany, 4 for France, etc. It does not mean, however, that these numbers are themselves limited to the subjects named; but when the classifier knows that a definite number is always to be found for a given subject it assists his memory. Similarly, the "form-divisions" at the head of each class in the Decimal scheme have an almost invariable meaning throughout. Similar form-divisions occur in the Expansive scheme, and the categorical numbers in the Subject scheme have also the mnemonic value which belongs to a number which may be applied to any part of the scheme with an invariable meaning.

III.2. Various very practical manipulations of notation have been devised to give great powers of division. For example, nearly every subject in the Decimal scheme can be divided geographically by using the geographical numbers from the History Class, 940-999. Thus

- 506 Scientific Societies.
- 506.42 English Scientific Societies.
- 506.43 German Scientific Societies.

and the subdivision of each may be carried as far as usefulness dictates. It will be noticed that the initial figure in 942 and 943 has been omitted. This is simply because 9 means history, and only the 42 and 43 are the geographical numbers. An understanding of this simple principle will save many curious errors in the use of Dewey's geographical divisions. The Expansive Classification obtains a similar result by the use of its Local List numbers, which may be added to any number in the scheme ; and the Subject scheme permits the addition of its Geographical Numbers to any Subject Number. Thus J535 is Witchcraft, and U830 is Surrey. By combining the numbers J535U83 we get "Witchcraft in Surrey." This method may be applied throughout the scheme.

113. Further definiteness in notation is obtained by specially designed author, chronological, and other book numbers. The principal of these and the most elaborate are the Cutter Author Marks. These are fully explained at the end of Cutter's *Expansive Classification: First Six Schemes*, and very full tables of the marks have been worked out by Sanborn and published by the Library Bureau. It is an alphabeting table consisting of the initial letter or letters of the author's name (or, in the case of anonymous books, of the first word not an article or preposition of the title ; or, in biography, of the surname of the biographee) followed by a decimal number. A single letter is used for names or words

commencing with all letters except vowels and S, for which two are used, and the combination Sc, for which three are used. Its method of application is simple. The books "are kept alphabeted by authors by marking them with the initial of the author's family name followed by one or more decimal figures assigned according to a table so constructed that the names whose initials are followed by some of the *first* letters of the alphabet have the *first* numbers, and those in which the initials are followed by later letters have later numbers." E.g. Gardiner G16, Gilman G42, Graham G76, etc.; Saint Sa25, Soper So60, etc.; Schneider Sch43, Schrift Sch83, etc. This is added to the classification number after a small space, e.g.

F45 G16 Gardiner's *History of England*.

The marks may be applied to the notation of any scheme.

114. Another author number is the Merrill, which is limited to 100 places. This is set out in full in Brown's *Subject Classification*, Introduction, p. 27. The combinations of the initial letters of the authors' names are worked out among 100 numbers as follows :

01 A	03 Als	05 Ash
02 Agre	04 Ap	06 B, etc.

and this number is added to the classification number. Hence a book by About would take its

classification number followed by 01, and any book by an author whose name falls between A and Agre would be marked similarly. An anglicised version of this has been worked out by Mr. J. D. Stewart in *The Library Association Record*, vol. ix, pp. 244-5, 1907.

115. A further method is that explained by Mr. L. Stanley Jast in *The Library World*, vol. iii, pp. 120, 150, 1900-1, in which the first three letters of the author's name are added to the class number, e.g.

580, Hoo Hooker's *Botany*.

with the addition of numbers to individualise the various works of the author.

116. A further auxiliary is the Biscoe Date Table, by which the letters A to R are used to indicate periods of history, e.g. A before Christ, B 0 to 999, C 1000 to 1499, D 1500 to 1599 and so on. This will be found at length in Brown's *Subject Classification*, Introduction, p. 29, with an extended table.

117. Various other interesting and suggestive manipulations of notation will be found in the introductions to the *Subject* and *Decimal* systems.

A NOTE ON NOTATION BIBLIOGRAPHY

118. An interesting introduction to the history of the subject is H. Rutherford Purnell's *Development of Notation in Classification* (*Library Assistant*, vol. viii, pp. 25-33, 44-50, 1911; also separately). Theory is dealt with in E. C. Richardson's *Classifi-*

tion, pp. 39-40 ; and theory and history are combined in J. D. Brown's *Library Classification and Cataloguing*. The notations of the Decimal, Expansive and Subject systems are fully explained in their several introductions and appendices.

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